U.S. DEPARTMENT OF COMMERCE
National Technical Information Service

PB-275 407

Awards Register. Grants Assistance Programs. Volume I Listing Awards During the Transition Quarter (July-September) of FY 1976, Except State and Local Assistance Awards

Environmental Protection Agency, Washington, D. C.

Dec 77

EPA-GAD/1-76-005

PB275407

AWARDS REGISTER GRANTS ASSISTANCE PROGRAMS

Volume I

Listing Awards During the Transitión Quarter (July-September) of FY 1976
Except State and Local Assistance Awards

U.S. ENVIRONMENTAL PROTECTION AGENCY
Washington, D.C. 20460

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U. S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

160

BIBLIOGRAPHIC DATA SHEET	1. Report No. EPA-GAD/1-76-005	2.	3. Recipient's Accession No.

4. Title and Subtitle
Awards Register
Grants Assistance Programs-Volume I listing
Awards during July-September of FY 1976 except
State and Local Assistance awards

5. Report Date Dec, 1977
(date of preparation)

6.

7. Author(s)
Special Projects & Control Section
Grants Operations Branch

8. Performing Organization Rept. No.

9. Performing Organization Name and Address
Grants Administration Division
Office of Resources Management
Office of Planning & Management
Environmental Protection Agency
Washington, D. C. 20460

10. Project/Task/Work Unit No.

11. Contract/Grant No.

12. Sponsoring Organization Name and Address
Same as item 9

13. Type of Report & Period Covered
July-Sept FY 1976

14.

15. Supplementary Notes

This is an addition to the series of Awards Registers

16. Abstracts

This publication lists the grant awards offered by EPA during the period of July-September, Fiscal Year 1976, for research, demonstration, training and fellowship programs.

A brief project description for most of the research and demonstration grants administered by Headquarters is contained in Section Two, arranged in ascending order of the Grant Identification Number. A Grant Number Index is included to assist cross-referencing into Section One material.

Section Three provides a cross-walk for use in identifying the program and sub-program area of a grant. This conversion is based upon classification of programs by the Office of Research and Development and the assignment of Program Element Numbers by their staff.

17. Key Words and Document Analysis. 17a. Descriptors

Water
Awards
Air
Solid Waste
Hazardous Materials
Pesticides
Grants
Radiation
Water Supply
Training
Fellowships

17b. Identifiers/Open-Ended Terms

EPA Awards for research, demonstration, training & Fellowship programs.

17c. COSATI Field/Group

18. Availability Statement Release Unlimited	19. Security Class (This Report) UNCLASSIFIED	21. No. of Pages
	20. Security Class (This Page UNCLASSIFIED	22. Price

PORTIONS OF THIS REPORT ARE NOT LEGIBLE.
HOWEVER, IT IS THE BEST REPRODUCTION
AVAILABLE FROM THE COPY SENT TO NTIS

DISCRIMINATION PROHIBITED

Federal law prohibits discrimination on the basis of race, color, religion, sex, age or national origin, in all programs and activities receiving assistance from the Environmental Protection Agency.

PREFACE

The Awards Register for July-September, 1976, consists of two volumes in which the data is organized first by State, then by grant program. Volume I provides information about the Agency's research, demonstration, training and fellowship awards in three separate sections:

Section One-geographic listing by State and program,

Section Two-Grant Number Index and brief project descriptions arranged in ascending order of the Grant Identification Number, and

Section Three-"cross-walk" to be used in determining the Office of Research and Development program and/or sub-program area in which an award was granted.

Volume II provides a geographic listing by State and grant program for State and local assistance program grants awarded during this three month period.

Project descriptions contained in Volume I were, for the most part, prepared by the grantees and are provided only for those grants administered by the EPA Headquarters office. The inclusion of this information has proven to be very useful from a management aspect as well as in meeting and fulfilling requirements for providing information to the public. The Grant Number Index is provided as an aid for cross-referencing information between Sections One and Two. Locating a grant number in this index, the reader will find the name of the applicant and the State location. Then by referring to that State's listing(s) in Section One, the particular grant number will be found.

Section Three is a listing of the fourteen subprogram areas of EPA's Office of Research and Development and the program elements assigned to each. By referencing the data in Section One, the user can "cross-walk" to Section Three to identify the program area for each grant by using the program element assigned to it.

Preparation of this publication was performed by Lynn Szedon with the assistance of Sandra Artis and Donna Whitaker. Computer programming assistance was provided by Donald L. Thie. Any comments or criticisms should be directed to Lynn Szedon, Grants Operations Branch, Grants Administration Division, on (202) 755-3370.

Grants Administration Division

SOURCES OF INFORMATION ON EPA GRANTS AWARDED, REPORTS GENERATED BY GRANTS AND OTHER GRANT RELATED MATERIALS

Awards Register, Grants Assistance Programs of EPA; Transition Quarter of Fiscal Year 1976 (July-September, 1976)

Volume I. Section I lists research, demonstration, training and fellowship awards by State, program, and grantee name. Each record provides applicant name, municipality, program element, title, project director, Grant Identification Number, type of grant award, date and dollar amount of award. Section II contains brief project descriptions for research and demonstration projects administered by Headquarters and is arranged in ascending order by the Grant Identification Number. An index is provided for cross-referencing the information between Sections I and II. Section III is a cross-walk for use in identifying the program/subprogram area of a grant in accordance with classifications of our Office of Research and Development. Environmental Protection Agency, EPA-GAD/1-76-005, NTIS number and price to be assigned.

Volume II. Lists all State and Local Assistance Awards by State, by program and by grantee name. Contents and format the same as for Volume I, Section One. Environmental Protection Agency, EPA-GAD/1-76-006, NTIS number and price to be assigned.

Awards Register, Grants Assistance Programs of EPA; January-June of Fiscal Year 1976

Volume I. Section I lists research, demonstration, training and fellowship awards by State, program, and grantee name. Section II contains brief project descriptions for research and demonstration projects administered by Headquarters and is arranged in ascending order by the Grant Identification Number. Section III is a cross-walk for use in identifying the program/subprogram area of a grant in accordance with classifications of our Office of Research and Development. Environmental Protection Agency, EPA-GAD/1-76-003, NTIS order number PB-260742, price $9.00.

Volume II. Lists all State and Local Assistance Awards by State, by program, and by grantee name. Contents and format the same as for Volume I, Section One. Environmental Protection Agency, EPA-GAD/1-76-004, NTIS order number PB-261980, price $11.00.

Awards Register, Grants Assistance Programs of EPA 1st Half Fiscal Year 1976 (July-December, 1975)

Volume I.	Section I lists all awards in research, demonstration, training and fellowships. Section II contains a brief description of most research and demonstration projects. Section III provides an index of all awards arranged by subject content according to the fourteen sub-program classifications of our Office of Research and Development. Environmental Protection Agency, EPA-GAD/1-76-001, NTIS order number PB-252893, price $5.25.
Volume II.	Lists all State and Local Assistance Awards. Environmental Protection Agency, EPA-GAD/1-76-002, NTIS order number PB-253091, price $11.00.

Awards Register, Grants Assistance Programs of EPA 2nd Half of Fiscal Year 1975 (January-June 1975)

Volume I.	Section I lists all awards in research, demonstration, training, and fellowships. Section II contains a brief description of most research and demonstration projects. Environmental Protection Agency, EPA-GAD/1-75-003. NTIS order number PB-245575, price $10.75, microfiche, $3.00.
Volume II.	Lists all State and Local Assistance awards. Environmental Protection Agency, EPA-GAD/1-75-004, NTIS order number PB-245576, price $11.75, microfiche, $3.00.

Semi-Annual Award Listing, Grants Assistance Programs of EPA; 1st Half Fiscal Year 1975 (July-December, 1974)

Volume I.	Lists all awards in research, demonstration, training and fellowships. Environmental Protection Agency, EPA-GAD/1-75-001. NTIS order number PB-241476, price $5.25, microfiche, $3.00.
Volume II.	Lists all State and Local Assistance awards. Environmental Protection Agency, EPA-GAD/1-75-002. NTIS order number PB-241400. Price $9.00, microfiche, $3.00.

Awards Register, Grants Assistance Programs of EPA Fiscal Year 1974 (July 1973 - June 1974)

Volume I.	Lists all awards in Fiscal Year 1974 except Waste Water Treatment Construction and Waste Water Treatment Reimbursement Awards. NTIS order number PB-238370, price $8.00, microfiche, $3.00.
Volume II.	Lists only Waste Water Treatment Construction Awards in Fiscal Year 1974. NTIS order number PB-238371, price $9.25, microfiche, $3.00.
Volume III.	Lists only Wastewater Treatment Reimbursement Awards in Fiscal Year 1974. NTIS order number PB-238372, price $9.00, microfiche, $3.00.

Awards Register, Grants Assistance Programs of EPA Fiscal Year 1973 (July 1972 - June 1973)

The format of this publication has the initial sort by State. Each entry includes grantee identification, program area, grant title, grant number, award date and dollar amount. Environmental Protection Agency 220/1-73-004, NTIS order number PB-229827, price $15.25, microfiche, $3.00.

The above publications can be purchased from:

National Technical Information Service (NTIS)
Department of Commerce
5285 Port Royal Road
Springfield, Virginia 22161
(703) 557-4650

Awards Register, Grants Assistance Programs of EPA Fiscal Year 1972 (July 1971 - June 1972)

This publication is currently out of print. It is available for reference at all EPA libraries and at EPA Headquarters, Grants Administration Division, 401 M Street SW, Washington, D.C.

Monthly Listing of Awards for Construction Grants for Wastewater Treatment Works

Awards for the wastewater treatment facilities construction grants under Public Law 92-500 made during a particular month are listed in a monthly publication entitled "Monthly Listing of Awards for Construction Grants for Wastewater Treatment Works." This publication is prepared by the Grants Administration Division and distributed and sold by the National Technical Information Service.

The March 1974 issue (PB-23130) provides a base listing of all grants awarded under Public Law 92-500. Beginning with the April 1974 issue (PB-231300-01), the listings will contain awards for one month only and will be numbered in sequence. Microfiche (24X) of each copy is also available. The subscription price is $120.00 for 12 issues. Previous issues can be purchased at $10.50 per copy.

The publication is distributed to subscribers approximately six weeks after the close of the awards-listed month. It may be obtained through:

National Technical Information Services
Department of Commerce
5285 Port Royal Road
Springfield, Virginia 22161
(703) 557-4650

NOTE: All of the preceeding publications are available for examination at the Grants Administration Division and Library of EPA Headquarters and each Regional Office.

FEDERAL ASSISTANCE PROGRAMS OF THE ENVIRONMENTAL PROTECTION AGENCY

This publication includes descriptive information about Environmental Protection Agency assistance programs reprinted from the Catalog of Federal Domestic Assistance, which was prepared for the Office of Management and Budget. Similar information on programs of all Federal agencies is included in the Catalog which is available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20420 for $18.00 and includes changes as issued for the 1977 edition. It is also available for public use in Federal Depository Libraries.

Copies of this publication may be obtained from the Environmental Protection Agency, Grants Operations Branch, Grants Administration Division (PM-21[illegible]), Office of Planning and Management, Washington, D.C. 20460.

OTHER GRANT RELATED INFORMATION

A brief summary of a grant project is available on the majority of research and demonstration grants.

These summaries are available for projects that have received Federal funding. In rare instances, a grant application may contain privileged information and is so designated. For these, only the award data, such as grant number, applicant name, organization, location, grant title, amount awarded, and award date is available; other information may be available depending on the particular circumstances.

The Smithsonian Science Information Exchange (SSIE), Room 300, 1730 M Street, N.W., Washington, D.C. 20036, receives a copy of the summary of a grant and makes it available to the public on a fee basis. The cost of a print-out, if the Agency is identified and the grant or contract number is provided, costs $2.00 per grant number with a $10,00 minimum fee. A search on a subject (topic) is $60.00 per search service for 1 to 50 titles, and an additional charge of 25¢ per title. A search on the investigator's name can also be performed. All inquiries and requests for this service should be addressed to SSIE or phone (202) 381-4211.

REPORTS GENERATED BY GRANT SUPPORTED PROJECTS

Final reports and other program reports generated by grant supported projects are published and made available if merited. Final report information is available from the following program offices:

For solid waste management and resource recovery:

Publication and Distribution Unit
Office of Solid Waste Management
Environmental Protection Agency
Cincinnati, Ohio 45268

For air pollution control:

Air Pollution Technical Information Center MD-35
Environmental Protection Agency
Research Triangle Park, North Carolina 27711

For pesticide publications:

Information Section WH-569
Office of Pesticide Programs
Environmental Protection Agency
401 M Street, SW
Washington, D.C. 20460

For other research and demonstration projects:

Technology Transfer Staff
Office of Research and Development
Environmental Protection Agency
Cincinnati, Ohio 45268

Each of the above units publishes a bibliographic list showing prices and giving purchasing information.

EPA REPORTS BIBLIOGRAPHY QUARTERLY SUPPLEMENT

(sponsored by Library Systems Branch)

The EPA Cumulative Bibliography 1970-1976 published in December 1976 (order number PB-265920, price code E99) contains a bibliographic citation with abstracts for reports generated by EPA and its predecessor agencies and entered into the NTIS collection through 1976. Access points to this information are by Report Title; Subject (keyword); Corporate or Personal Author; Contract Number; and Accession/ Report Number.

Beginning in March 1977, quarterly update supplements will be published listing and indexing EPA technical reports and journal articles entered into the NTIS collection during the preceding quarter. An additional index titled "Sponsoring EPA Office" is included as well. The fourth quarterly issue will cumulate and become the annual index for the year.

To order documents or subscriptions, complete and return the NTIS order form to the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161. Do not order from the U.S. Environmental Protection Agency. If what you have ordered is in stock on hand, you should receive your order within two weeks after it arrives at NTIS. If what you have ordered must be reproduced from a microform, or if all the paper copies have been sold and reprints are in process, you should receive your order within four to six weeks. Infrequently, orders may be further delayed by a contractor's inability to deliver to NTIS. You will be notified if such a delay is expected.

This EPA Reports Bibliography Quarterly Supplement series is available on annual subscription from NTIS at a cost of $45.00 for North American Continent users (single copies, when available, are $12.50 each). For those outside the North American Continent, please write NTIS for prices.

MAIL TO:

NTIS

National Technical Information Service
U.S. DEPARTMENT OF COMMERCE
Springfield, Va 22161

Date ____________

PURCHASER: (Telephone ____________)

Name ____________

Address ____________

City, State, Zip ____________

Attention: ____________

SHIP TO: (Enter if different from address at left)

Name ____________

Organization ____________

Address ____________

City, State, Zip ____________

(703) 557-4650 TELEX 89-9405

☐ Charge my NTIS deposit account no. ____________
☐ Send me an application for an NTIS deposit account.
☐ Purchase order no. ____________
☐ Check enclosed for $ ____________
☐ Bill me and add $5 per order.
☐ Charge to my American Express Card account number.

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Valid through ____________

Signature ____________

Routing Code. NTIS can label each document for routing within your organization. If you want this service put your routing code in the box marked Routing Code.

Convert price code to dollars

All Prices Subject to Change

Item Number	Routing Code	Check one		Quan-tity	Unit Price	Total Price
		Paper Copy	Micro fiche			
					Enter Grand Total →	$

THIS FORM MAY BE REPRODUCED

The following EPA libraries maintain for reference purposes completed sets of EPA reports, on microfiche, covered by the original bibliography and this supplement.

Region I Library
Room 2211-B, JFK Federal Bldg.
Boston, Massachusetts 02203

National Marine Water Quality Lab
P. O. Box 277
West Kingston, Rhode Island 02892

Region II Library
26 Federal Plaza
New York, New York 10007

Region II Field Office Library
Edison, New Jersey 08817

Region III Library
Curtis Bldg., 6th & Walnut Streets
Philadelphia, Pennsylvania 19106

Headquarters Library, Room 2404 WSM
401 M Street, S.W.
Washington, D.C. 20460

Region IV Library
345 Courtland Street, N.E.
Atlanta, Georgia 30309

Library Services MD-35
Research Triangle Park
North Carolina 27711

Southeast Environmental Research Lab
College Station Road
Athens, Georgia 30601

Gulf Breeze Laboratory
Sabine Island, Bldg. 29
Gulf Breeze, Florida 32561

Region V Library
230 Dearborn Street Room 1455-A
Chicago, Illinois 60604

Environmental Research Center Library
26 West St. Clair Street
Cincinnati, Ohio 45268

Environmental Research Lab-Duluth
6201 Congdon Boulevard
Duluth, Minnesota 55804

Region VI Library
First International Bldg.
1201 Elm Street
Dallas, Texas 75270

Robert S. Kerr Environmental Research
Laboratory
P. O. Box 1198
Ada, Oklahoma 74820

Region VII Library
1735 Baltimore Avenue, Room 249
Kansas City, Missouri 64108

Region VIII Library, 8M-ASL
1860 Lincoln Street
Denver, Colorado 80225

National Field Investigation Center
Room A-1209, Bldg. 53
Box 25227, Denver Federal Center
Denver, Colorado 80225

Region IX Library
100 California Street
San Francisco, California 94111

National Environmental Research Center
P. O. Box 15027
Las Vegas, Nevada 89114

Region X Library
1200 Sixth Avenue
Seattle, Washington 98101

National Environmental Research Center
200 S.W. 35th Street
Corvallis, Oregon 97330

SECTION I

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
A L A B A M A						
** RESEARCH **						
ALABAMA, UNIV. OF UNIVERSITY	TRACE ANALYSIS OF ORGANIC CONTAMINANTS IN ENVRN. BY MULTIDIMENSIONAL HIGH RESOLUTION GLC/MS	BERTSCH, W.	80474801	NEW	76/09/14	$48,695
AUBURN UNIV. AUBURN	FATE AND EFFECTS OF ATRACINE IN SALT MARSH ECOSYSTEMS	ROUSE,D.R.	80383502	CONT	76/07/07	$50,000
SOUTHERN RES. INST. BIRMINGHAM	ASSESSMENT OF APPLICATION OF ELECTROSTATIC PRECIPITATORS CONTROL EMISSIONS IN NON-FERROUS METALLURGY	OGLESBY, S.	80476201	NEW	76/09/30	$124,764
SOUTHERN RES. INST. BIRMINGAHM	EVALUATION OF APPLICABILITY OF ELECTROSTATIC PRECIPITATORS FOR NON-FERROUS METALS EMISSION CONTROL	OGLESBY, S.	80495501	NEW	76/09/30	$261,298

A L A S K A

** RESEARCH **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
ALASKA, UNIV. OF FAIRBANKS	ALASKAN OIL SEEPS: THEIR CHEMICAL & BIOL. EFFECTS ON THE INTERTIDAL ENVRN.	SHAW, D. G.	R0392202	CONT	76/08/06	$129,840
ALASKA, UNIV. OF FAIRBANKS	ASSESSMENT OF EFFECTS ON BOTTOM DISTURBANCE ON THE ENVRN. ON A CLEAR SUBARCTIC STREAM	MORROW, JAMES E.	R0394502	CONT	76/07/09	$50,000
ALASKA, UNIV. OF FAIRBANKS	EFFECTS OF OIL SPILLS ON ARCTIC LAKE SYSTEMS	BARSDATE, R.	R0415202	CONT	76/07/16	$146,320
ALASKA, UNIV. OF FAIRBANKS	STUDY OF POLLUTION ABATEMENT & ICE FOG REDUCTION AT A SUB-ARCTIC COAL-FIRED HEATING PLANT	LEONARD, LEROY	R0483301	NEW	76/07/16	$64,861
ALASKA, UNIV. OF FAIRBANKS	DEFINITION OF ALASKAN WETLANDS BY FLORISTIC CRITERIA	MURRAY, D. F.	R0496501	NEW	76/09/23	$80,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	A R I Z O N A					
** RESEARCH **						
ARIZONA, UNIV. OF TUCSON	CHEMISTRY ION SELECTIVE ELECTRODES &APPLI QUASI-REAL TIME MONITORING PARTICULATE NITRATES ATMOSPHERE	FREISER, HENRY	R0338903	CONT	76/09/16	$59,949
ARIZONA, UNIV. OF TUCSON	ENVIRONMENTAL MONITORING AND ASSESSMENT OF COAL STRIP MINING	THORUD, D. B.	R0467901	NEW	76/08/10	$196,183
ARIZONA, UNIV. OF TUCSON	AREAL PREDICTION OF WATER AND SOLUTE FLUXES IN THE UNSATURATED ZONE	WARRICK, A. W.	R0475101	NEW	76/08/10	$42,182
** TRAINING **						
ARIZ DEPT OF HEALTH SVC PHOENIX	OPER TNG DEV PROJECT OPER TNG DEV PROJECT FOR MAINT OF WWT PLT	RICHARD E SHANKS	00906802	CONT	76/07/16	$20,000
BUR OF DISEASE CONT AZ PHOENIX	LAB TRAINING	JOHN COUNTS	00912201	NEW	76/08/16	$12,040

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
		A R K A N S A S				
** TRAINING **						
ARK DEPT OF POLLUTION CONTROL ECOL LITTLE ROCK	ARKANSAS STATE TRAINING PROGRAM FOR WWT PLANT OPERATORS	S LADD DAVIES, DIRECTO	00612101	NEW	76/07/27	$12,300

CALIFORNIA

**** RESEARCH ****

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
CALIFORNIA INST. OF TECH. PASADENA	RELATIONSHIP OF THE SMOG AEROSOL TO POLLUTION SOURCES	FRIEDLANDER, S. K.	80216004	INCR	76/09/23	$54,551
CALIFORNIA INST. OF TECHNOLOGY PASADENA	DEVELOPMENT&APPLICATION MULTIPLE TRACER TECHNIQUES STUDY POLLUTION TRANSPORT & DISPERSION ATMOSPHERE	SHAIR, F. H.	80499001	NEW	76/09/30	$54,457
CALIFORNIA STATE DEPT. OF HEALTH SACRAMENTO	HAZARDOUS WASTE SAMPLING, ANALYSIS, AND COMPATIBILITY STUDY	STEPHENS, R. D.	80469201	NEW	76/08/06	$77,200
CALIFORNIA, DEPT. OF HEALTH SACRAMENTO	INVESTIGATION OF PARTICULATE MATTER MONITORING USING CONTACT ELECTRICITY	WESOLOWSKI, JEROME J.	80371901	INCR	76/08/23	$27,000
CALIFORNIA, UNIV. OF BERKELEY	SOLVENT EXTRACTION FOR TREATMENT & RECOVERY OF CHEMICALS FROM ACETIC-ACID PRODUCTION WASTEWATER	KING, C. JUDSON	80377302	CONT	76/09/08	$59,981
CALIFORNIA, UNIV. OF RIVERSIDE	OXIDANT/PRECURSOR RELATIONSHIPS	STEPHENS, E.	803[illegible]9902	CONT	76/09/15	$40,000
CALIFORNIA, UNIV. OF BERKELEY	BIOLOGICAL CONTROL IN AN URBAN PEST MANAGEMENT SYSTEM	VAN DEN BOSCH, ROBERT	80420501	NEW	76/07/08	$50,000
CALIFORNIA, UNIV. OF LAJOLLA	NATIONAL MARINE POLLUTION MONITORING PROGRAM	GOLDBERG, EDWARD D.	80421501	INCR	76/09/30	$314,819
CALIFORNIA, UNIV. OF RIVERSIDE	DETERMINATION & PREDICTION CHEMICAL FORMS OF TRACE METALS IN SEWAGE SLUDGES & SLUDGE AMENDED SOILS	LUND, L. J.	80451601	NEW	76/08/06	$80,311
CALIFORNIA, UNIV. OF LOS ANGELES	YESINIA ENTEROCOLITICA RESERVIORS AND IMPORT IN HUMAN DISEASE	PICKETT, M. J.	80468101	NEW	76/08/23	$27,867

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	CALIFORNIA					
** RESEARCH **						
CALIFORNIA, UNIV. OF BERKELEY	WASTEWATER RENOVATION RECYCLE FOR NOVEL POWER PLANT COOLING CYCLE	SEPHTON, H. H.	80476001	NEW	76/09/16	$46,883
CENTRAL CONTRA COSTA SAN. DIST. WALNUT CREEK	EVALUATION OF CONTROL STRATEGY & MANAGEMENT INFO. SYS. PERFORMANCE ADVANCED WATER RECLAMATION PLANT	NILES, D. G.	80465701	NEW	76/09/08	$50,000
CHINO BASIN MUN. WATER DIST. CUCAMONGA	REDUCTION OF SALINE POLLUTION OF GROUNDWATER ATTRIBUTED TO DAIRY OPERATIONS	ROSS, E. G.	80462001	NEW	76/07/21	$67,422
HYDROCOMP INC. PALO ALTO	COMPREHENSIVE PACKING FOR SIMULATION OF WATERSHED HYDROLOGY & WATER QUALITY	JOHANSON, R. C.	80497101	NEW	76/09/23	$274,225
HYDROCOMP, INC. PALO ALTO	BASIN MODELING OF SOIL LOSS AND SEDIMENT TRANSPORT	DONIGIAN, ANTHONY S.	80372601	INCR	76/09/14	$89,677
LAC/USC MEDICAL CENTER LOS ANGELES	BIOLOGIC INDICATOR FOR AIR POLLUTION	SHERWIN, RUSSELL P.	80088105	INCR	76/07/22	$19,298
LOMA LINDA UNIV. LOMA LINDA	CHROMOSOMAL ABERRATIONS IN PERIPHERAL LYMPHOCYTES OF STUDENTS DUE TO PHOTOCHEMICAL AIR POLLUTION	MAGIE, A. R.	80460601	NEW	76/07/16	$250,055
PACIFIC, UNIV. OF STOCKTON	COCARCINOGENIC POTENTIAL OF ARSENIC IN DRINKING WATER	SHIRACHI, D. Y.	80461001	NEW	76/09/27	$116,508
SAN JOSE STATE UNIV. FDN. SAN JOSE	TRANSITION ZONE BETWEEN MARSH AND UPLANDS	HARVEY, H. T.	80496401	NEW	76/09/14	$53,000
SOUTHERN CALIFORNIA MEDICAL CTR. LOS ANGELES	BIOLOGIC INDICATOR FOR AIR POLLUTION	SHERWIN, RUSSELL P.	80454501	NEW	76/09/16	$80,114

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
CALIFORNIA						
** RESEARCH **						
SOUTHERN CALIFORNIA METRO WATER DIST. LOS ANGELES	WATER QUALITY EFFECTS RELATED TO BLENDING WATERS OF DIFFERENT ORIGIN IN DISTRIBUTION SYSTEMS	PEARSON, H. E.	R0470901	NEW	76/09/16	$44,350
STANFORD RES. INST. MENLO PARK	ATMOSPHERIC FATES OF HALOGENATED COMPOUNDS	SINGH, H. B.	R0380202	CONT	76/07/07	$70,00
STANFORD UNIV. STANFORD	ACTIVATED CARBON FOR WASTEWATER TREATMENT: INVESTIGATION OF ACTIVATION PROCESS PARAMETERS	LECKIE, JAMES O.	R0318801	NEW	76/09/17	$85,000
STANFORD UNIV. STANFORD	APPLICATION OF ADSORPTION THEORY TOWARDS VIRUS DECONTAMINATION	PARKS, G.	R0501601	NEW	76/09/24	$59,916
STEVE K. LEUNG DAVIS	LITERATURE REVIEW OF ECONOMIC TECHNIQUES FOR THE VLAUATION OF AGRICULTURE CROP YIELDS	LEUNG, S. K.	R0495701	NEW	76/09/24	$9,563
TETRA TECH. INC. LAFAYETTE	MODELING FOR 208 AREA WIDE WASTE MGMT. PLANNING IN NON DESIGNATED AREAS	CHEN, C. W.	R0445001	INCR	76/09/15	$33,375
** DEMONSTRATION **						
CALIFORNIA STATE DEPT OF HEALTH SACRAMENTO	IMPLEMENTATION OF CALIFORNIA'S HAZARDOUS WASTE MANAGEMENT PROGRAM	HARVEY F. COLLINS, PHD	00907001	INCR	76/09/24	$25,000
CALIFORNIA STATE WATER RESOURCES BD. SACRAMENTO	REDUCE UNIT TOXICITY EMISSION RATES FROM WWT PLANTS BY DESIGN OPTIMIZATION OF CHLORINATION PROCESS	DENDY, BILL	R0345901	INCR	76/09/23	$18,000
NORTH MARIN CNTY. WATER DIST. NAVATO	BENEFICIAL DISPOSAL OF WATER PURIFICATION PLANT SLUDGES IN WASTEWATER TREATMENT	NELSON, JOHN O.	R0333601	INCR	76/09/08	$10,200
SACRAMENTO REGIONAL CNTY. SAN. DIST. SACRAMENTO	RANCHO CORDOVA BREAKPOINT CHLORINATION DEMONSTRATION	HYDE, H. S.	R0334301	INCR	76/09/08	$30,000

C A L I F O R N I A

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
** DEMONSTRATION **						
SAN LUIS OBISPO CNTY. SAN LUIS OBISPO	IMPLEMENTATION OF PROJECT SORT (SEPARATION OF OFFICE & RESIDENTIAL TRASH)	PROTOPAPAS, G. C.	80478901	NEW	76/08/10	$43,750
** TRAINING **						
CA STATE DEPT OF EDUC SACRAMENTO	AUTO EMISSION CONTROL MECHANICS TRAINING	LEONARD O HAZEN	00912101	NEW	76/07/27	$20,000
CALIF ST BD OF FIRE SERVICES SACRAMENTO	EMERGENCY HANDLING OF SPILLS & FIRES INVOLVING PESTICIDES & OTHER AGRICULTURAL CHEMICALS	EDWARD SEITS	00913001	NEW	76/09/29	$10,000
CALIF SWRCB SACRAMENTO	TNG OF WWT OPERATORS ON SITE TNG	ROBERT V DAIGH	00912401	NEW	76/07/19	$30,000
CALIF WATER POLL CONTROL ASSOC PASADENA	DEVELP REFERRAL SERVICE/CWPCA		00912601	NEW	76/09/30	$5,500
CALIFORNIA DEPT. OF HEALTH SACRAMENTO	CONFERENCE ON METHODS IN AIR POLLUTION STUDIES	WESOLOWSKI, JEROME J.	90067301	NEW	76/09/30	$17,200
CALIFORNIA, UNIV. OF IRVINE	GRADUATE TRAINING IN AIR POLLUTION	SAMUELSON, G. S.	90060001	NEW	76/09/13	$41,700
CO OF SAN MATEO SAN MATEO	WWT P OPER OST TNG	E FRANCES DAVID	00912501	NEW	76/07/16	$27,100
HUMBOLDT STATE UNIV. ARCATA	INSTRUCTIONAL DEVELOPMENT WORKSHOPS	GEARHEART, R. A.	90066401	INCR	76/07/08	$30,000
SOUTHERN CALIFORNIA, UNIV. OF LOS ANGELES	DISSEMINATION OF APEX II	MCGINTY, RICHARD	90055801	INCR	76/09/29	$14,914

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
C A L I F O R N I A						
** TRAINING **						
SOUTHERN CALIFORNIA, UNIV. OF LOS ANGELES	RESEARCH & DEVELOPMENT OF METRO-APEX WATER PLANNING GAMING SIMULATION	MCGINTY, R. T.	90059301	NEW	76/08/17	$98,750
SOUTHERN, CALIFORNIA, UNIV. OF LOS ANGELES	ENVIRONMENTAL MANAGEMENT INSTITUTE	BARBARO, GLORIA C.	90055701	INCR	76/09/30	$157,897
** FELLOWSHIPS **						
CALIFORNIA STATE COLLEGE DOMINGUEZ HILLS	M.S./ENVRN. STUDIES	FOTIADES, M. R.	91078201	INCR	76/09/29	$805
CALIFORNIA, UNIV. OF DAVIS	M.S./SCIENCE MECHANICAL ENGR.	GRIVET, M. J.	91086001	NEW	76/07/30	$7,644
SANTA CLARA, UNIV. OF SANTA CLARA	M.S./MECHANICAL ENGR.	PULLMAN, J. B.	91084201	NEW	76/07/16	$6,370
SOUTHERN CALIFORNIA, UNIV. OF LOS ANGELES	M.S./ENVRN. ENGR.	BLEDSOE, WILLIAM A.	91069401	INCR	76/07/30	$1,568
SOUTHERN CALIFORNIA, UNIV. OF LOS ANGELES	M.S.	KONSTANTOUROS, A	91079801	NEW	76/09/28	$2,480

C O L O R A D O

** RESEARCH **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
COLORADO DEPT. OF HEALTH DENVER	AS. AIR & WATER QUALITY STUDIES IN COLORADO ENERGY ARE	ROBERT SIEK, ACTING DI	00813102	CONT	76/09/30	$28,400
COLORADO SCHOOL OF MINES GOLDEN	POLICY ANALYSIS FOR HAZARDOUS WASTE CONTROL	TAYLOR, G. C.	80466101	NEW	76/09/27	$83,990
COLORADO STATE UNIV. FORT COLLINS	IRRIGATION RETURN FLOW QUALITY LITERATURE ABSTRACTING	SKOGERBOE, GAYLORD	80042606	CONT	76/09/13	$46,987
COLORADO STATE UNIV. FORT COLLINS	WATER QUALITY HYDROLOGY AFFECTED BY OIL SHALE DEVELOPMENT	MCWHORTER, D. B.	80368402	CONT	76/09/13	$50,271
COLORADO STATE UNIV. FORT COLLINS	VEGETATIVE STABILIZATION OF PARAHO SPENT OIL SHALE	BERG, W. A.	80378802	CONT	76/09/13	$33,393
COLORADO STATE UNIV. FORT COLLINS	TOXIC EFFECTS ON THE AQUATIC BIOTA FROM COAL AND OIL SHALE DEVELOPMENT	SKOGERBOE, R. K.	80395002	CONT	76/07/02	$550,000
COLORADO STATE UNIV. FT. COLLINS	NATIONAL CONFERENCE ON IRRIGATION RETURN FLOW QUALITY CONTROL	SKOGERBOE, G. V.	80467101	NEW	76/07/13	$39,850
COLORADO STATE UNIV. FORT COLLINS	SALINITY MANAGEMENT IN IRRIGATED AGRICULTURE	SKOGERBOE, G. V.	80467201	NEW	76/07/30	$58,617
COLORADO STATE UNIV. FT. COLLINS	WATER QUALITY HYDROLOGY OF SURFACE MINE WATERSHEDS	MCWHORTHER, D. B.	80467301	NEW	76/09/09	$39,366
COLORADO STATE UNIV. FORT COLLINS	VEGETATIVE STABILIZATION OF SPENT OIL SHALES	BERG, W. A.	80471901	NEW	76/09/13	$21,054

C O L O R A D O

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
** RESEARCH **						
COLORADO STATE UNIV. FORT COLLINS	IRRIGATION & GROUNDWATER MGMT. FOR LAND DISPOSAL OF ANIMAL WASTES	WALKER WYNN R.	80482701	NEW	76/09/23	$357,713
COLORADO STATE UNIV. FORT COLLINS	ASSESSING THE SPATIAL VARIABILITY OF IRRIGATION WATER APPLICATIONS	WALKER, WYNN R.	80482801	NEW	76/09/13	$28,945
COLORADO STATE UNIV. FORT COLLINS	VARIOUS HALOCARBON CHEMICAL REACTANTS ON STRATOSPHERIC & TROPOSHERIC OZONE & PHOTOCHEMICAL PROCESS	CRUTZEN, PAUL S.	80492101	NEW	76/09/28	$34,000
COLORADO STATE UNIV. FORT COLLINS	BEHAVIOR OF MICROORGANISMS IN THE COLD ENVRN.	MORRISON, S. M.	80504101	NEW	76/09/23	$25,000
COLORADO, UNIV. OF BOULDER	EFFECT OF OZONATION ON ORGANICS IN WASTEWATER	CHAPPELL, WILLARD R.	80447201	INCR	76/08/31	$135,000
DENVER, UNIV. OF DENVER	IMPACT OF CONDITIONING ON POWER PLANT EMISSIONS THROUGH CONTROLLED AIRBORNE SAMPLING	WILLIAMS, RALPH E.	80482901	NEW	76/09/27	$88,689
LARIMER-WELD REGIONAL COUNCIL GOVER. LOVELAND	DETERMINATION OF BEST MANAGEMENT PRACTICES & INSTIT	GLENN BILLINGS, CHAIRM	00816501	NEW	76/07/12	$100,000
UPPER THOMPSON SAN. DIST. ESTES PARK	AN EVALUATION OF POLLUTION CONTROL PROCESSES-UPPER THOMPSON SAN. DIST.	GERE, GILES H.	80383101	INCR	76/09/24	$100,000
** DEMONSTRATION **						
COLORADO DEPT. OF HEALTH DENVER	STATE OF COLORADO SOLID WASTE MANAGEMENT DEMONSTRATION PROJECT.	ORVILLE F. STODDARD, P	00817301	NEW	76/08/16	$70,000
** TRAINING **						
AMERICAN PUBLIC WORKS ASSOCIATION NORTHGLENN	1976 SOLID WASTE MANAGEMENT WORKSHOP	RICHARD P. LUNDAHL, CH	00816701	NEW	76/07/29	$2,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
		COLORADO				
** TRAINING **						
AMERICAN WATER WORKS ASSOC. DENVER	AN INSTRUCTIONAL APPROACH IN SUPPORT FOR IMPLEMENTING THE SAFE DRINKING WATER ACT	HASKINS, BILL D.	90060801	NEW	76/08/06	$75,000
AMERICAN WATER WORKS ASSOC. DENVER	WATER TREATMENT PLANT OPERATIONS AND LABORATORY ANALYSES	HASKINS, B. D.	90063201	NEW	76/09/27	$67,000
COLORADO STATE UNIV. FORT COLLINS	DEVELOPMENT OF A SELF INSTRUCTIONAL EMISSIONS CONTROL PROGRAM	HAYES, B. D.	90062101	NEW	76/08/19	$125,260
DENVER COMMUN. COLLEGE DENVER	MAINTENANCE TRAINING MATERIAL DEVELOPMENT	FEELEY, T.	90062801	NEW	76/09/30	$35,028
** FELLOWSHIPS **						
COLORADO STATE UNIV. FT. COLLINS	M.S.	ROMERO, A. E.	91078701	NEW	76/09/29	$6,038
COLORADO UNIV. BOULDER	M.S./ENGR.	PLOG, JOHN G.	91052801	INCR	76/09/30	$1,676
COLORADO, UNIV. OF DENVER	B.S./CIVIL ENGR.	KINSEY, JOHN S.	91065901	INCR	76/09/28	$861

CONNECTICUT

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
** RESEARCH **						
CONNECTICUT, UNIV. OF STORRS	SELECTIVE MEDIUM FOR CANIDA ALRICANS	BUCK, JOHN D.	80282701	INCR	76/09/16	$10,545
RISDON MANUFACTURING CO. WATERBURY	NICKEL RECOVERY & POLLUTION CONTROL BY ELECTRODIALYSIS	KENNEDY, JAMES R.	80374201	INCR	76/08/06	$10,500
SEABOARD METAL FINISHING CO., INC. WEST HAVEN	DIALYSIS PURIFICATION OF METAL FINISHING RINSE WATER	WHEELER, C.R.	80465501	NEW	76/09/09	$25,000
SIAM INST. FOR MATHEMATICS & SOCIETY NEW CANAAN	SIMS 3 YEAR STUDY: STATISTICS & ENVIRONMENTAL HEALTH	THOMSEN, DONALD L.	80493201	NEW	76/09/28	$45,000
YALE UNIV. NEW HAVEN	ENVIRONMENTAL MONITORING USING MOLLUSCAN SHELL-GROWTH & LIFE HISTORY DATA	RHOADS, D. C.	80490901	NEW	76/09/24	$65,000
** DEMONSTRATION **						
CONNECTICUT D.E.P. HARTFORD	STATE SOLID WASTE DEMO GRANT	JOESEPH L. BOREN	00113301	NEW	76/08/12	$101,000
HAFNER INDUSTRIES, INC. NEW HAVEN	PILOT PLANT DEMONSTRATION & EVALUATION OF PVC WASTES RECLAIMED BY HAFNER PROCESS	HAFNER, EDWIN A.	80469301	NEW	76/09/30	$85,000
** TRAINING **						
CONNECTICUT, STATE OF HARTFORD	LEGISLATIVE EDUCATION WORKSHOP	DAVID B OGLE	00113601	NEW	76/09/16	$6,000

DELAWARE

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
** RESEARCH **						
DELAWARE STATE COLLEGE DOVER	AN ENVIRONMENTAL HEALTH STUDY OF LEAD IN TEETH	WILKINSON, DONALD R.	80289002	INCR	76/09/09	$25,990
DELAWARE, UNIV. OF NEWARK	DEVELOP ACTIVATED CARBON PROCESS FOR TREATMENT&DISPOSAL OF CHROMIUM CONTAINING INDUSTRIAL WASTEWATER	HUANG, C. P.	80465601	NEW	76/09/23	$35,414
NATIONAL COMMITTEE FOR IAWPR NEWARK	EIGHTH INTERNATIONAL CONFERENCE ON WATER POLLUTION RESEARCH	DICK, RICHARD I.	80428801	NEW	76/08/26	$48,600
** TRAINING **						
DEL. DEPT. OF NAT RES & ENVIRO CONTROL DOVER	SPECIALIZED DIRECT TRAINING COURSES FOR WATER/WASTEWATER FACILITIES PERSONNEL	VASUKI, N.C.	00312701	NEW	76/09/20	$10,000

DISTRICT OF COLUMBIA

** RESEARCH **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
AMERICAN DEFENSE PREPAREDNESS ASSOC. WASHINGTON	STATE OF ART OF DEMILITARIZATION OF EXPLOSIVES & PROPELLANTS	SULLIVAN, A. D.	80440101	INCR	76/09/24	$5,000
AMERICAN FROZEN FOOD INST. WASHINGTON	SWEET CORN PROCESSING MODIFICATION FOR REDUCED EFFLUENT	FARQHAR, J. W.	80459701	NEW	76/07/02	$34,580
AMERICAN PETROLEUM INST. WASHINGTON	EVALUATE SELECTED SURFACE TREATMENT AGENTS FOR PROTECTION RESTORATION OF SHORELINES SALT MARSH AREAS	NANNEY, T.	80463901	NEW	76/07/08	$75,000
AMERICAN SOCIETY FOR MICROBIOLOGY WASHINGTON	AMERICAN SOCIETY FOR MICROBIOLOGY CONFERENCE ON NITRIFICATION & REDUCTION OF NITROGEN OXIDES	PAYNE, W. J.	80471801	NEW	76/08/18	$5,100
AMERICAN STATISTICAL ASSOCIATION WASHINGTON	FOURTH SYMPOSIUM ON STATISTICS AND THE ENVIRONMENT	BISGYER, E. M.	80454201	NEW	76/07/30	$10,000
ENVIRONMENTAL LAW INST. WASHINGTON	MANAGEMENT OF ENVRN. QUALITY:PREPARING FOR IMPLEMENTATION OF INTEGRATED REGIONAL PROGRAMS	TARLOCK, A. D.	80446901	NEW	76/07/08	$208,748
NATIONAL DEMONSTRATION WATER PROJECT WASHINGTON	RURAL WATER SURVEY	ZIMMERMAN, S.	80476101	NEW	76/09/29	$649,648
RESOURCES FOR THE FUTURE, INC. WASHINGTON	RESIDUALS ENVIRONMENTAL QUALITY MANAGEMENT HANDBOOK	BOWER, B. T.	80452801	NEW	76/08/04	$324,300
SMITHSONIAN INST. WASHINGTON	NON-POINT POLLUTION STUDIES ON AGRICULTURAL LAND USE TYPES PREVALENT IN COASTAL PLAIN ZONE OF MD.	CORRELL, D. L.	80453601	INCR	76/09/13	$12,000
			80453601	INCR	76/09/23	$127,115

MD.

DISTRICT OF COLUMBIA

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
** DEMONSTRATION **						
INSTITUTE OF INDUSTRIAL LAUNDERERS WASHINGTON	DEMONSTRATION OF ULTRAFILTRATION&CARBON ADSORPTION FOR TREATMENT OF INDUSTRIAL LAUNDERING WASTEWATER	HUMPHREY, CHARLES E.	R0436701	INCR	76/07/22	$80,000
** TRAINING **						
LEAGUE OF CITIES-CONFERENCE OF MAYORS WASHINGTON	INTERGOVERNMENTAL ANALYSIS OF AREAWIDE WASTE TREATMENT PLANNING REQUIREMENT OF SECTION 208	AVENT, J.	90062301	NEW	76/09/29	$78,900
TECHNICAL INFORMATION PROJECT WASHINGTON	CITIZEN SOLID WASTE EDUCATION PROGRAM	PURCELL, A. H.	90060501	NEW	76/07/08	$34,993

F L O R I D A

** RESEARCH **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
FLORIDA A&M UNIV. TALLAHASSEE	INDIVIDUAL & SYNERGISTIC EFFECTS OF PESTICIDES ON AQUATIC ORGANISMS	SUBRAHMANYAM, C. B.	80578601	NEW	76/07/02	$54,163
FLORIDA STATE OFFICE OF HEALTH TAMPA	MONITORING FOR PATHOGENIC NAEGLERIA	WELLINGS, FLORA MAE	80437501	INCR	76/07/16	$37,333
FLORIDA STATE UNIV. TALLAHASSEE	MESOSCALE SULFUR BALANCE STUDIES	WINCHESTER, JOHN W.	80388701	INCR	76/09/23	$65,000
FLORIDA, UNIV. OF GAINESVILLE	SIMULATION OF NITROGEN MOVEMENT AND TRANSFORMATION IN THE PLANT ROOT ZONE	DAVIDSON, J. M.	80360702	INCR	76/09/28	$129,182
FLORIDA, UNIV. OF GAINESVILLE	STUDY OF INTERFACE PROBLEMS IN SAMPLING AND MEASUREMENT OF PARTICULATE POLLUTANTS	LUNDGREN,, D. A.	80369202	CONT	76/08/04	$30,000
FLORIDA, UNIV. OF GAINESVILLE	PESTICIDE MIGRATION & DEGRADATION RATES IN SOILS RECEIVING HIGH CHEMICAL CONCENTRATIONS	DAVIDSON, JAMES M.	80384901	CONT	76/07/16	$64,989
FLORIDA, UNIV. OF GAINESVILLE	URINARY STONE DISEASE AND WATER HARDNESS	FINLAYSON, B.	80453001	NEW	76/09/30	$42,922
FLORIDA, UNIV. OF GAINESVILLE	SEWAGE SLUDGE VIRAL AND PATHOGENIC AGENTS IN SOIL PLANTS ANIMAL SYSTEM	DAVIDSON, J. M.	80457001	NEW	76/08/06	$266,273
FLORIDA, UNIV. OF LAKE ALFRED	PESTICIDES IN AGRI. ENVRN.	NIGG, H. N.	80463301	NEW	76/09/15	$57,571
FLORIDA, UNIV. OF GAINESVILLE	SPECIFIC METHOD FOR ANALYSIS OF SULFURIC ACID MISTS	URONE, P.	80463401	NEW	76/08/26	$15,000

F L O R I D A

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
** RESEARCH **						
HILLSBOROUGH BD. OF CNTY. COMM. TAMPA	EVALUATION OF NUTRIENT CONTROL PROCESSES IN THE TAMPA BAY AREA	JOHNSON, W. D.	80500501	NEW	76/09/24	$76,500
MIAMI, UNIV. OF CORAL GABLES	INFLUENCE ON WATER QUALITY OF INCREASED TEMPERATURE AFFECTING PARTICULATE IN NATURAL WATERS	HANSEN, W. D.	80382602	CONT	76/08/13	$54,824
MIAMI, UNIV. OF MIAMI	ISOLATION AND STUDY OF CHLOR ORGANICS RESULTING FROM CHLORINATION OF SEAWATER	CARPENTER, J.	80389302	CONT	76/08/23	$160,000
MIAMI, UNIV. OF CORAL GABLES	MAN'S EXPOSURE TO HALOGENATED ORGANICS FROM DRINKING WATER	SHAFILK, T. M.	80461101	NEW	76/08/10	$156,167
MIAMI, UNIV. OF CORAL GABLES	PROVIDE MATERIALS, DEMONSTRATIONS,WORKSHOP AND LABORATORY ANALYSES ON HANDLING PESTICIDE POISONINGS	DAVIES, J. E.	80462301	NEW	76/08/24	$70,000
MIAMI, UNIV. OF MIAMI	SOUTHEAST FLORIDA OCEAN OUTFALL STUDY	SNEDAKER, S. C.	80474901	NEW	76/09/27	$400,000
MIAMI, UNIV. OF CORAL GABLES	INACTIVATION OF NATURALLY OCCURRING ENTEROVIRUSES	BEASLEY, A.	80478001	NEW	76/09/13	$60,226
WEST FLORIDA, UNIV. OF PENSACOLA	CYCLING OF XENOBIOTICS THROUGH ESTUARINE AND MARINE SEDIMENTS	D'ASARO, CHARLES N.	80445801	INCR	76/09/09	$99,991
WEST FLORIDA, UNIV. OF PENSACOLA	TOXIC SUBLETHAL & LATENT EFFECTS OF SELECTED PETROLEUM HYDROCARBONS & BARIUM SULFATE	RAO, K. RANGA	80454101	INCR	76/09/23	$126,103
** DEMONSTRATION **						
FLORIDA DEPT. OF ENVRN. REGULATION TALLAHASSEE	LAKE JACKSON NON-POINT SOURCE ABATEMENT PROGRAM	FARLEY, DAN	80481501	NEW	76/08/31	$231,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
		FLORIDA				
** TRAINING **						
FLORIDA, UNIV. OF GAINESVILLE	AIR POLLUTION TRAINING PROGRAM	URONE, P.	90054202	CONT	76/09/27	$55,600
MIAMI-DADE COMMUN. COLLEGE MIAMI	NPDES EFFLUENT MONITORING TRAINING	PISTORINA, JOHN	90052001	INCR	76/07/21	$24,975

G E O R G I A

** RESEARCH **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
ATLANTA UNIV. CTR. ATLANTA	STUDIES ON THE MUTAGENICITY OF CHEMICAL CARCINOGENS	SHEEHY, RONALD J.	80420401	INCR	76/09/16	$10,000
FORT VALLEY STATE COLLEGE FORT VALLEY	POTENTIAL BENEFICAL USE OF INDUSTRIAL WASTE HEAT FOR GREENHOUSE PRODUCTION OF BEDDING PLANTS	CRUMBLY, I.	80449901	NEW	76/08/17	$92,689
GEORGIA INST. OF TECH. ATLANTA	STUDY OF MATERIALS LEACHED FROM PLASTIC PIPE IN DYNAMIC SYSTEM	HAVLICEK, S. C.	80483001	NEW	76/09/30	$81,800
GEORGIA, UNIV. OF ATHENS	IMPACT OF NUTRIENT AND SEDIMENTS ON SURFACE WATERS IN THE U. S.	GOLLEY, F. G.	80486801	NEW	76/08/26	$100,035

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
		H A W A I I				
** RESEARCH **						
HAWAII, UNIV. OF KANEOHE	KANEOHE BAY: RESPONSES OF A TROPICAL ESTUARY TO RELAXATION OF SEWAGE STRESS	SMITH, STEPHEN V.	R0398301	INCP	76/09/08	$5,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
		I D A H O				
** DEMONSTRATION **						
NEZ PERCE CNTY. LEWISTON	RECYLING AND RESOURCE RECOVERY PLANNER	KIRKLAND, L. A.	R0479901	NEW	76/07/02	$16,500
** TRAINING **						
ID DEPT. OF HEALTH & WELFARE BOISE	WASTEWATER OPERATOR TRAINING PROGRAM	MILTON G. KLEIN, DIREC	00010801	INCR	76/09/02	$5,500

I L L I N O I S

**** RESEARCH ****

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
AMERICAN MEDICAL ASSOC. CHICAGO	AIR POLLUTION HEALTH EFFECTS SYMPOSIA	BARTON, FRANK H.	80893301	NEW	76/09/17	$10,000
ATLANTIC RICHFIELD CO. HARVEY	POWDERED CARBON ACTIVATED SLUDGE FILTRATION PROCESSES FOR PETROLEUM REFINERY WASTEWATER	KNECHT, A. T.	80473101	NEW	76/09/23	$89,789
CANADA DEPT OF ENVIRONMENT OTTAWA	FINANCIAL ASSISTANCE BY USEPA TO CANADA IN SUPPORT OF WATER QUALITY SAMPLING CRUISES ON LAKE SUPERIO	DR E BENNETT SCI	00520701	INCR	76/09/30	$15,000
CHICAGO MED. SCHOOL CHICAGO	METHODOLOGY FOR DETECTION OF ONCOGENIC & NONONCOGENIC VIRUSES FOUND IN POLLUTED WATERS & FISH	BROWN, F. R.	80208703	CONT	76/09/15	$80,000
DEPAUL UNIV. CHICAGO	POLYCHLOROBIPHENYLS IN THE ATMOSPHERE IN PRECIPITATION IN THE LAKE MICHIGAN BASIN	MURPHY, THOMAS J.	80391501	INCR	76/07/02	$7,000
IIT RESEARCH INST. CHICAGO	A STUDY OF THE IDENTITY & SOURCES OF ATMOSPHERIC AEROSOLS	DRAFTZ, RONALD G.	80307803	INCR	76/09/29	$12,500
IIT RESEARCH INST. CHICAGO	STUDY OF SOME IMPORTANT AIR POLLUTANTS	SOLOMON, T. J.	80380502	CONT	76/09/09	$55,662
			80380502	INCR	76/09/28	$83,000
ILLINOIS, UNIV. OF URBANA	VIRUS SENSITIVITY TO CHLORINE DISINFECTION OF WATER SUPPLIES	ENGELBRECHT, R. S.	80334603	CONT	76/08/04	$64,710
ILLINOIS, UNIV. OF CHICAGO	HEALTH EFFECTS OF HUMAN EXPOSURE TO BARIUM IN DRINKING WATER	BRENNIMEN, G. R.	80391802	CONT	76/07/21	$113,130

APPLICANT MUNICIPALITY	PROJECT DIRECTOR / FELLOW TITLE	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
I L L I N O I S					
** RESEARCH **					
ILLINOIS, UNIV. OF CHICAGO	BRENNIMAN, G. R. RECREATIONAL WATER QUALITY AND HEALTH	R80456901	NEW	76/08/10	$52,721
ILLINOIS, UNIV. OF URBANA	GRIFFIN, R. A. PREDICTING ORGANIC CONTAMINANT REMOVAL BY CLAY MINERALS & WASTE MATERIALS	R80468801	NEW	76/09/09	$60,495
ILLINOIS, UNIV. OF URBANA	KLEIN, RICHARD E. IMPACT ASSESSMENT OF ENERGY CONVERSION FACILITIES IN THE OHIO RIVER BASIN, PHASE I	R80482101	NEW	76/07/29	$188,305
ILLINOIS, UNIV. OF URBANA	STUKEL, JAMES J. IMPACT ASSESSMENT OF ENERGY CONVERSION FACILITIES IN THE OHIO RIVER BASIN	R80488801	NEW	76/07/29	$163,495
		R80488801	INCR	76/09/29	$6,000
ILLINOIS, UNIV. OF CHICAGO	NEAL, A. HEALTH EFFECTS OF AEROSOLS EMITTED FROM AN ACTIVATED SLUDGE PLANT	R80500301	NEW	76/09/28	$567,279
NEW YORK STATE DEC ALBANY	LEO J HETLING DIR GENESEE RIVER PILOT WATERSHED STUDY/WYOMING, YATES & LIVINGSTON CNTYS.	00514401	INCR	76/08/09	$84,000
		00514401	INCR	76/09/30	$84,000
** DEMONSTRATION **					
AMERICAN SOCIETY OF PLANNING OFFICIALS CHICAGO	BEAL., F. COOPERATIVE APPROACHES TO DISPOSAL SITING	R80473201	NEW	76/07/08	$84,907
SPRINGFIELD, CITY OF SPRINGFIELD	CHAMBERS, M. D. SPRINGFIELD-CENTRAL ILLINOIS RESOURCE RECOVERY IMPLEMENTATION GRANT	R80479101	NEW	76/08/06	$25,000

I L L I N O I S

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
** TRAINING **						
ILLINOIS EPA SPRINGFIELD	WPC TRAINING GRANT	DR R H BRICELAND DIR	00516203	CONT	76/08/05	$32,439
ILLINOIS EPA APC SPRINGFIELD	LOCAL AGENCY STAFF TRAINING	R H BRICELAND DIR	00531201	NEW	76/08/04	$7,175
SOUTHERN ILLINOIS UNIV. EDWARDSVILLE	TROUBLESHOOTING OPERATION AND MAINTENANCE PROBLEMS AT MUN. WASTEWATER TREATMENT FACILITIES	BRYANT, J. O.	90063901	NEW	76/09/30	$25,738
** FELLOWSHIPS **						
GOVERNORS STATE UNIV. PARK FOREST S.	B.S./CHEMISTRY	PAYNE, I. M.	91078601	NEW	76/07/02	$1,084

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	INDIANA					
** RESEARCH **						
EVANSVILLE, CITY OF EVANSVILLE	PREVENTION OF FORMATION AND REMOVAL OF HALOGENATED ORGANIC USING CHLORINE DIOXIDE AND GRANULAR CARON	MILLS, D. B.	80490201	NEW	76/09/29	$181,000
HOLCOMB RES. INST. INDIANAPOLIS	CONFERENCE ON PLANNING ALTERNATIVES FOR MUNICIPAL WATER SYSTEMS	HOLTZ, D.	80498801	NEW	76/09/29	$10,000
INDIANA UNIV. FDN. BLOOMINGTON	LOWER OHIO RIVER BASIN IMPACT STUDIES	RANDOLPH, J. C.	80484901	NEW	76/07/29	$145,968
			80484901	INCR	76/09/30	$9,680
NOTRE DAME, UNIV. OF NOTRE DAME	INTERDISCIPLINARY EVALUATION OF EUTROPHIC LAKE RECLAMATION	THEIS, T. L.	80124506	CONT	76/07/16	$70,000
NOTRE DAME, UNIV. OF NOTRE DAME	LAGOON,SPRAY RUNOFF IRRIGATION & CHEMICAL TREATMENT OF SLAUGHTERHOUSE WASTEWATERS IN COLD CLIMATES	KETCHUM, L. H.	80467701	NEW	76/09/28	$101,400
PURDUE RES. FDN. WEST LAFAYETTE	SEMI-EMPIRICAL CORRELATION FOR AIRCRAFT EXHAUST EMISSIONS & STANDARDS	MELLOR, A. M.	80[illegible]8301	NEW	76/07/16	$52,895
PURDUE RES. FDN. W. LAFAYETTE	CHARATERIZATION OF METAL COMPLEXES IN SEWER SLUDGE SYSTEMS	SOMMERS, L. E.	80454701	NEW	76/07/21	$83,325
PURDUE UNIV. W. LAFAYETTE	TOXICITY, INTERACTIONS & METABOLISM OF IMPORTANT PESTICIDES IN MAMMALS	HOLLINGWORTH, R. M.	80396502	CONT	76/07/08	$63,430
** DEMONSTRATION **						
NOBLE CNTY. SOIL & WATER CONSERV. DIST FORT WAYNE	RESTORATION OF SKINNER LAKE IN NOBLE CNTY.	LEBAMOFF, I. A.	80469501	NEW	76/09/17	$429,304

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
INDIANA						
** FELLOWSHIPS **						
EVANSVILLE, UNIV. OF EVANSVILLE	B.S./ENVRN. SCIENCES	HEARRING, S. M.	91085201	NEW	76/09/29	$3,532
PURDUE UNIV. WEST LAFAYETTE	M.S./ENVRN. ENGR.	LOUGHEED, S. D.	91092801	INCR	76/09/28	$188
PURDUE UNIV. W. LAFAYETTE	M.S./ENVRN. ENGR.	STEVENS, P.	91097101	NEW	76/08/23	$6,500

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	I O W A					
** RESEARCH **						
AMES, CITY OF AMES	EVALUATION OF AMES SOLID WASTES RESOURCES & ENERGY RECOVERY SYSTEM	CHANTLAND, A. O.	80390301	INCR	76/08/06	$74,057
IOWA STATE UNIV. AMES	DEVEL. & TESTING OF MATHEMATICAL MODELS AS MGMT. TOOLS FOR AGRICULTURAL NON-POINT POLLUTION CONTROL	JOHNSON, H. P.	80410202	CONT	76/07/13	$244,626
			80410202	INCR	76/09/14	$37,202
IOWA STATE UNIV. AMES	DEVELOPMENT OF SAFE METHODS FOR DISPOSAL OF EXCESS PESTICIDES USED BY FARMERS & AGRI. APPLICATORS	HALL, C. V.	80453301	NEW	76/09/14	$178,501
** TRAINING **						
IOWA DEPT OF ENVIRONMENTAL QUALITY DES MOINES	W/W TREATMENT CERTIFICATION & TRAINING PROGRAM	CRANE, LARRY E EXECUTI	00709301	INCR	76/09/17	$5,000
IOWA DEPT. OF ENVRN. QUALITY DES MOINES	STAFF SKILL ASSESSMENT AND TRAINING PLAN METHODOLOGY DEVELOPMENT	CRANE, L. E.	90063801	NEW	76/09/28	$10,000
			90063801	NEW	76/09/28	$10,000
NATIONAL FIELD RES. CTR., INC. IOWA CITY	NATIONAL ENVIRONMENTAL/ENERGY WORKFORCE ASSESSMENT	BENESH, R. L.	90059101	INCR	76/09/13	$12,038
			90059101	INCR	76/09/23	$48,500

K A N S A S

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
** RESEARCH **						
KANSAS STATE UNIV. MANHATTAN	APPLICATION OF CONTINUOUS WATERSHED MODELING RUNOFF MGMT. & CONTROL	KOELLIKER, J. K.	80379701	INCR	76/08/23	$11,671
** TRAINING **						
KANSAS DEPARTMENT OF HEALTH & ENVIRON TOPEKA	DECISION MAKER'S GRANT	GRAY, MELVILLE W DIREC	00708301	INCR	76/09/20	$1,600
KANSAS DEPT OF HEALTH AND ENVIRONMENT TOPEKA	TRAINING FACILITY STUDY	GRAY, MELVILLE W DIREC	00709501	NEW	76/07/01	$5,000
KANSAS, UNIV. OF LAWRENCE	TRAINING GRANT IN WATER SUPPLY & POLLUTION CONTROL	O'BRIEN, WALTER J.	90013606	INCR	76/07/02	$13,200

K E N T U C K Y

** RESEARCH **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
KENTUCKY, UNIV. OF LEXINGTON	AN IMPACT ASSESSMENT OF ENERGY CONVERSION FACILITIES IN THE OHIO RIVER BASIN	BLOME, D. A.	R0481701	NEW	76/07/29	$70,060
LOUISVILLE, UNIV. OF LOUISVILLE	MIDWEST ENERGY FACILITIES IMPACT ASSESSMENT	SPENCER, HUGH T.	R0481601	NEW	76/07/29	$55,888

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
L O U I S I A N A						
** RESEARCH **						
GRAMBLING STATE UNIV. GRAMBLING	EFFECTS OF CADMIUM OF ULTRASTRUCTURE OF TYPE A SPERMATOGONIA	JORDAN, CHESTER L.	80315402	INCR	76/08/25	$20,303
JEFFERSON PARISH JEFFERSON	GRANULAR ACTIVATED CARBON STUDIES	BRODTMANN, NOEL V.	80457101	NEW	76/07/08	$294,094
			80457101	INCR	76/09/23	$297,720
LOUISIANA STATE UNIV. BATON ROUGE	DETERMINATION OF ENVRN. IMPACT OF SEVERAL SUBSTITUTE CHEMICALS IN AGRI. AFFECTED WETLANDS	DAY, J.	80497601	NEW	76/08/26	$99,754
LOUISIANA STATE UNIV.&A&M COLLEGE BATON ROUGE	BEHAVIOR OF DDT&KEPONE IN SEDIMENT-WATER SYSTEMS UNDER DIFFERENT OXIDATION-REDUCTION & PH CONDITIONS	PATRICK, W. H.	80494001	NEW	76/09/23	$99,149
NEW ORLEANS SEWERAGE & WATER BD. NEW ORLEANS	EVALUATE TECHNIQUES & ECONOMICS IN REMOVING TRACE ORGANIC COMPOUNDS FROM NEW ORLEANS WATER SUPPLY	SULLIVAN, G. JOSEPH	80440401	INCR	76/09/24	$235,385
NEW ORLEANS, UNIV. OF NEW ORLEANS	CARCINOGENIC PHOTO-OXIDATION PRODUCTS FROM PETROLEUM PAH'S AT AIR-SEA INTERFACE	LASETER, J. L.	80464701	NEW	76/07/30	$65,000
** FELLOWSHIPS **						
TULANE UNIV. NEW ORLEANS	M.S./PUBLIC HEALTH ADMINISTRATION	DAWSEY, JOE M.	91073701	NEW	76/07/30	$4,265

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	MAINE					
** RESEARCH **						
MAINE MUN. ASSOC. AUGUSTA	SEPTAGE TREATMENT/MANAGEMENT	SALISBURY, J.	80480401	NEW	76/08/10	$100,000
MAINE, UNIV. OF BANGOR	EFFECTS OF PARTICULATES ON OZONE DISINFECTION OF BACTERIA & VIRUSES IN WATER	SPROUL, O. J.	80458701	NEW	76/08/10	$54,037
** TRAINING **						
MAINE WASTEWATER CONTROL ASSC. WINTHROP	COMPETENCY BASED TRNG. & DELIVERY SYS. DEVELOPMENT	CHARLES ENMAN	00110001	NEW	76/08/26	$10,000
MAINE, STATE OF AUGUSTA	WWTP OPERATOR TRAINING	DAVID E SMITH	00113501	NEW	76/09/24	$7,140

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
MARYLAND						
** RESEARCH **						
JOHN HOPKINS UNIV. BALTIMORE	ENUMERATION OF SHIGELLA IN POLLUTED WATER	OLIVIERI, V. P.	80459601	NEW	76/08/04	$18,000
JOHNS HOPKINS UNIV. BALTIMORE	PROPOSAL TO IMPLEMENT AND ASSESS SELECTED APPLICATIONS OF THE SEAS MODEL	LAKSHMANAN, T. R.	80486901	NEW	76/09/08	$73,612
JOHNS HOPKINS UNIV. BALTIMORE	SYSTEMATIC APPROACH TO DATA COLLECTION AND EVALUATION	HANKE, S. H.	80502101	NEW	76/09/27	$96,643
MARYLAND, UNIV. OF COLLEGE PARK	FIELD INVESTIG. CHLORINATED & BROMINATED ORGAN. COMPOUDS FORMED IN SALINE POWER PLANT COOLING WATER	HELZ, G. H.	80383902	CONT	76/07/21	$28,000
MARYLAND, UNIV. OF BALTIMORE	DETECTION OF MUTAGENIC/CARCINOGENIC ALTERATION IN FISH AND ITS APPLICATION TO HUMAN HEALTH	HINTON, D. E.	80486601	NEW	76/09/30	$110,000
NATIONAL COUNCIL ON RADIATION BETHESDA	ASSESSMENT OF RADIATION LEVELS & HAZARDS	TAYLOR, L. S.	80257003	CONT	76/09/30	$50,000
** TRAINING **						
CHARLES CNTY. COMMUN. COLLEGE LA PLATA	EFFLUENT MONITORING PROCEDURES TRAINING PROGRAM	SCHWING, CARL H.	90050101	INCR	76/07/02	$50,000
			90050101	INCR	76/09/27	$30,000
CHARLES CNTY. COMMUN. COLLEGE LA PLATA	WATER POLLUTION CONTROL TRAINING & MATERIAL DEVELOPMENT	SCHWING, CARL H.	90061401	NEW	76/07/08	$60,000
			90061401	INCR	76/09/30	$44,800

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
M A R Y L A N D						
** TRAINING **						
MARYLAND DEPT OF NAT RES ANNAPOLIS	TRAINING WWT PLANT OPERATORS	ANDREWS, THOMAS C.	00311102	INCR	76/09/30	$6,800
** FELLOWSHIPS **						
JOHNS HOPKINS UNIV. BALTIMORE	M.S.	NACE, R. L.	91096801	NEW	76/08/23	$3,127
JOHNS HOPKINS UNIV. BALTIMORE	M.S./ENVRN. ENGR.	JENG, BIH-JING	91096901	NEW	76/08/26	$1,495
MARYLAND, UNIV. OF COLLEGE PARK	M.S./MECHANICAL ENGR.	SHAVER, HARVEY E.	91096001	NEW	76/07/16	$1,800
MARYLAND, UNIV. OF COLLEGE PARK	B.S./WATER RESOURCES MGMT.	SLEEGER, P. A.	91096401	NEW	76/07/16	$3,158
MARYLAND, UNIV. OF COLLEGE PARK	M.S./ENVRN. BIOLOGY/GEOLOGY	ASNER, J. F.	91096501	NEW	76/07/08	$1,920
MARYLAND, UNIV. OF COLLEGE PARK	M.S.	RAMSEY, W. L.	91096601	NEW	76/08/23	$1,644

M A S S A C H U S E T T S

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
** RESEARCH **						
HARVARD UNIV. CAMBRIDGE	PHYSIOLOGICAL RESPONSE TO ATMOSPHERIC POLLUTANTS	AMDUR, M. O.	80203021	CONT	76/09/29	$57,927
HARVARD UNIV. CAMBRIDGE	HIGH VELOCITY FABRIC FILTRATION	FIRST, M. W.	80470001	NEW	76/08/10	$63,031
HARVARD UNIV. CAMBRIDGE	MECHANISM OF DIF-OFF OF VIRUSES IN SEA WATER	MITCHELL, RALPH	80483201	NEW	76/09/27	$53,000
JBF SCIENTIFIC CORP. WILMINGTON	SIMPLIFY THE USE & IMPROVE THE STRUCTURE OF KOH-CHANG MODEL FOR DISPERSION OF DREDGED MATERIALS	JOHANSON, E.	80499401	NEW	76/09/23	$49,838
MASSACHUFTTS INST. OF TECH. CAMBRIDGE	NO EMISSION FROM FLUIDIZED COMBUSTION	BEER, J. M.	80497801	NEW	76/09/17	$99,898
MASSACHUS[illegible] OF TECH. CAMB[illegible]	COMBUSTION RESEARCH ON COAL NITROGEN AND PARTICULATE ORGANIC MATTER	HOWARD, J. B.	80324203	CONT	76/09/27	$179,986
MASSACHUSETTS INST. OF TECH. CAMBRIDGE	CHEMICAL MODELING OF METALLIC WASTE DISPOSAL	MOREL, FRANCOIS M.	80373802	CONT	76/07/21	$27,690
MASSACHUSETTS INST. OF TECH. CAMBRIDGE	CATALYTIC DESULFURIZATION AND DENITROGENATION	SATTERFIELD, C. N.	80412302	CONT	76/09/29	$46,700
MASSACHUSETTS, UNIV. OF AMHERST	SHORT COURSE ON APPLICATION OF STORMWATER MANAGEMENT MODELS	DEGIANO, FRANCIS	80306901	.NCR	76/07/30	$5,222
MASSACHUSETTS, UNIV. OF AMHERST	COPROSOTANOL AS AN INDICATOR OF FECAL POLLUTION IN SEAWATER	WALKER, R. W.	80497001	NEW	76/09/29	$29,709

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	M A S S A C H U S E T T S					
** RESEARCH **						
NEW ENGLAND AQUARIUM BOSTON	DEVELOPMENT OF BIOLOGICAL BIOASSAY FOR EVALUATING DREDGING ACTIVITIES	MICHAEL, A. D.	R0496701	NEW	76/09/27	$82,450
SALEM & BEVERLY WATER SUPPLY BD BEVERLY	EFFECT OF TURBIDITY ON BACTERIAL COUNTS & COLIFORM ENUMERATION IN WATER DISTRIBUTION SYSTEMS	REILLY, J. K.	R0472401	NEW	76/09/24	$27,640
** DEMONSTRATION **						
BOSTON METRO. DIST. COMM. BOSTON	CHARLES RIVER LOWER BASIN DESTRATIFICATION PROJECT	FERULLO, ALFRED	R0481201	NEW	76/09/16	$296,700
MARLBOROUGH, CITY OF MARLBOROUGH	OZONE DEMONSTRATION STUDY-ELECTRON BEAM ACCELERATOR	SHARON, PAUL A.	R0494601	NEW	76/09/24	$103,129
MASSACHUSETTES, STATE OF BOSTON	SOLID WASTE DEMONSTRATION	ALDEN E. COUSINS	00104601	INCR	76/07/23	$25,000
MASSACHUSETTS DEPT ENVRN QUALITY ENGR BOSTON	LAKES RESTORATION TECHNIQUES FOR EUTROPHICATION CONTROL & INSTITUTIONAL DEVELOPMENT-LAKE COCHITUATE	PATTERSON, ALAN	R0472701	NEW	76/08/26	$125,000
WELLESLEY, TOWN OF WELLESLEY	INTEGRATED IRON & NITROGEN CONTROL FOR LAKE MGMT. (MORSES POND)	BERDAN, M. R.	R0469601	NEW	76/08/23	$308,740
** TRAINING **						
BOSTON COLLEGE WESTON	NEW ENGLAND CONSORTIUM ON ENVIRONMENTAL PROTECTION (NECEP)	RIDER, T. H.	90060101	NEW	76/07/16	$29,998
HARVARD COLLEGE BOSTON	GRADUATE TRAINING IN AIR POLLUTION	MOELLER, D. W.	90054702	CONT	76/09/13	$55,600

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
MASSACHUSETTS						
** TRAINING **						
MASSACHUSETTS INST. OF TECH. CAMBRIDGE	WATER QUALITY SYSTEMS MODELING & MGMT.	HARLEMAN, DONALD R. F.	90016004	INCR	76/08/23	$4,837
NEW BEDFORD CONSORTIUM NEW BEDFORD	DESIGN & IMPLEMENT TRNG.PRGM. IN AWT TECHNOLOGY	RALPH SCHMARSON	00109901	NEW	76/09/07	$14,800
NEW ENGLAND INTERSTATE WPCC BOSTON	INNOVATIVE LAB TECHNIQUES IN WWT	FREDERICK K. SCHAUFFLE	00110401	NEW	76/07/13	$10,000
SPRINGFIELD TECH COMM. COLL. SPRINGFIELD	WPC-STATE & LOCAL MANPOWER DEVELOPMENT	ROBERT C. GEITZ	00111501	NEW	76/07/19	$10,900
** FELLOWSHIPS **						
HARVARD UNIV. CAMBRIDGE	M.S./CITY & REGIONAL PLANNING	MURPHY, M. J.	91083101	NEW	76/09/28	$6,820

MICHIGAN

**** RESEARCH ****

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
MICHIGAN ENVRN. RES. INST. ANN ARBOR	CLADOPHORA MEASUREMENTS USING REMOTE SENSING	WEZERNAK, CHESTER T.	R0361101	INCR	76/07/09	$20,100
MICHIGAN STATE UNIV EAST LANSING	POLLUTION OF GREAT LAKES BY LAND USE PRACTICES & FRUIT ORCHARD FARMING	THOMAS G BARR DIR	00514301	INCR	76/08/04	$69,000
			00514301	INCR	76/09/30	$41,000
MICHIGAN STATE UNIV. EAST LANSING	ECOSYSTEM RESPONSES TO ALTERNATIVE PESTICIDES IN THE ENVIRONMENT	BROWN, A. W.	R0385902	INCR	76/09/14	$14,005
MICHIGAN STATE UNIV. EAST LANSING	DEVELOPMENT OF MANAGEMENT MODELS FOR STREAM ECOSYSTEMS	BOLING, R.H.	R0442401	INCR	76/09/14	$25,000
MICHIGAN TECH. UNIV. HOUGHTON	PHYSICAL & CHEMICAL IDENTIFICATION OF DIESEL ENGINE EXHAUSE PARTICULATE MATTER	JOHNSON, J. H.	R0259603	CONT	76/09/29	$51,210
MICHIGAN, UNIV. OF ANN ARBOR	WATER QUALITY STUDIES ON RIVER NILE & LAKE NASSER	MANCY, K.	R0329103	CONT	76/09/22	$19,327
MICHIGAN, UNIV. OF ANN ARBOR	LONG PATH AIR POLLUTION MONITOR EVALUATION	BARTMAN, FREDERICK L.	R0339902	INCR	76/09/15	$15,000
MICHIGAN, UNIV. OF ANN ARBOR	NITRIFICATION STUDIES	BORCHARDT, JACK A.	R0340701	INCR	76/07/16	$35,000
MICHIGAN, UNIV. OF ANN ARBOR	NUTRIENT AND PLANKTON RELATIONSHIPS IN NORTHERN LAKE MICHIGAN	SCHELSKE, C. L.	R0450301	INCR	76/09/23	$132,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	M I C H I G A N					
** RESEARCH **						
MICHIGAN, UNIV. OF ANN ARBOR	CHEMICAL AMPLIFIERS AS ODD HYDROGEN RADICAL DETECTORS	STEDMAN, D. H.	R0460701	NEW	76/08/26	$37,034
MICHIGAN, UNIV. OF ANN ARBOR	GUIDE TO CRUSTACEAN ZOOPLANKTON OF GREAT LAKES	GANNON, J. E.	R0465201	NEW	76/08/10	$12,600
MICHIGAN, UNIV. OF ANN ARBOR	RATES OF ACCUMULATION OF POTENTIALLY HAZARDOUS SUBSTANCES IN RECENT SEDIMENTS OF LAKE HURON	ROBBINS, J. A.	R0468601	NEW	76/07/16	$50,000
** TRAINING **						
MICHIGAN DNR LANSING	WASTEWATER TREATMENT PLANT OPERTOR TRAINING PROGRAM SEC 104(G)(1)	W G TURNEY CHIEF	00532401	NEW	76/09/16	$25,140

M I N N E S O T A

**** RESEARCH ****

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
MINNESOTA, UNIV. OF ST. PAUL	FORMATIONS OF ATMOSPHERIC AEROSOLS	WHITBY, KENNETH T.	R0385102	INCR	76/08/13	$25,000
MINNESOTA, UNIV. OF MINNEAPOLIS	BIOMANIPULATION--AN ECOSYSTEM APPROACH TO LAKE RESTORATION	SHAPIRO, JOSEPH	R0387002	CONT	76/09/15	$94,626
MINNESOTA, UNIV. OF ST. PAUL	CONTINUOUS FLOW BIOASSAYS USING NATURAL PERIPHYTON COMMUNITIES WITH EMPH. ON THE EFFECTS OF COAL LEA	GERHART, D. Z.	R0393202	CONT	76/07/13	$55,000
MINNESOTA, UNIV. OF ST. PAUL	ORGANIC LEACHING & PARTICULATE DISPERSION FROM COAL	CAPLE, RONALD	R0395202	CONT	76/09/09	$105,839
MINNESOTA, UNIV. OF MINNEAPOLIS	RESEARCH ON AIR SAMPLING FILTER MEDIA	LUI, B. Y.	R0460001	NEW	76/08/06	$49,992
MINNESOTA, UNIV. OF MINNEAPOLIS	RENEWAL OF WATER TEMPERATURE STUDIES AT THE USEPA MONTICELLO FIELD STATION	STEFAN, H.	R0473601	NEW	76/09/14	$24,989
MINNESOTA, UNIV. OF ST. PAUL	STRUCTURE ACTIVITY CORRELATION STUDIES	MAGNUSON, V. R.	R0495301	NEW	76/09/15	$44,000
MINNESOTA, UNIV. OF ST. PAUL	GENERALIZATION OF WATER QUALITY CRITERIA USING CHEMICAL MODELS	HARRISS, D. K.	R0499601	NEW	76/09/17	$46,262
MINNESOTA, UNIV. OF ST. PAUL	AREA OF DEGREE OF INFLUENCE OF A HEATED DISCHARGE ON A YELLOW PERCH POPULATION IN LAKE-RIVER ENVRN.	SINIFF, D. B.	R0499701	NEW	76/09/09	$18,000
WINONA STATE UNIV. WINONA	VEGETATIVE CRITERIA FOR DELINEATION OF UPPER LIMIT OF WETLANDS CONTIGUOUS WITH UPPER GREAT LAKES	JEFFERSON, C. A.	R0498101	NEW	76/09/16	$32,946

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	M I N N E S O T A					
** DEMONSTRATION **						
DULUTH, CITY OF DULUTH	CITY OF DULUTH MUNICIPAL SOLID WASTE RESOURCE RECOVERY & RECYCLING PROGRAM	HOGG, K. S.	80480101	NEW	76/07/08	$21,000
ELY, CITY OF ELY	LAKE RESTORATION BY PHOSPHORUS CONTROL	GREHEK, J. P.	80230901	INCR	76/09/27	$314,485
HENNEPIN CNTY. PARK RESERVE DIST. MAPLE PLAINS	RESTORATION OF HYLAND LAKE	COCHRAN, D. K.	80470701	NEW	76/08/10	$98,325
ST. PAUL METRO. WASTE CONTROL COMM. ST. PAUL	PROCESS AUTOMATION EVALUATION	POLTA, R. C.	80360202	CONT	76/08/06	$137,917
WASECA, CITY OF WASECA	RETENTION & TREATMENT OF INFLOW TO CLEAR LAKE	HAARMAN, R.	80469101	NEW	76/09/27	$269,075
** TRAINING **						
MINNESOTA PCA ROSEVILLE	OPERATION REGIONAL TRAINING	L E RICHIE DIR	00530301	NEW	76/07/26	$14,297
** FELLOWSHIPS **						
MINNESOTA, UNIV. OF MINNEAPOLIS	M.S./ENVRN. HEALTH	WHEAR, THOMAS C.	91057301	INCR	76/07/30	$1,047
MINNESOTA, UNIV. OF MINNEAPOLIS	M.S./PUBLIC HEALTH	LOKEN, L. C.	91082601	NEW	76/07/08	$8,070
MINNESOTA, UNIV. OF MINNEAPOLIS	M.S./ENVRN. HEALTH	BOOLE, GREGORY S.	91093801	NEW	76/09/27	$4,270

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
M I S S I S S I P P I						
** RESEARCH **						
MISSISSIPPI, UNIV. OF HATTIESBURG	FATE & IMPACT OF PENTACHLOROPHENOL IN A FRESHWATER ECOSYSTEM	PIERCE, RICHARD H.	80382001	INCR	76/08/04	$28,990

M I S S O U R I

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
** RESEARCH **						
MIDWEST RESEARCH INST. KANSAS CITY	PROCEDURE&COMPUTER PACKAGE QUANTIFYING&RELATING NON-POINT SOURCE POLLUTANT LOADS SURFACE WATER QUALI	NEBGEN, J.	80464301	NEW	76/08/25	$67,957
MISSOURI, UNIV. OF ROLLA	WOOD WASTE AS A POWER PLANT FUEL IN THE OZARKS	FLANIGAN, VIRGIL	80427001	NEW	76/09/23	$50,000
MISSOURI, UNIV. OF COLUMBIA	RESEARCH SYPOSIUM-MANAGEMENT OF GAS & LEACHATE FROM LANDFILLS	BANERJI, SHANKHA K.	80485901	NEW	76/08/06	$22,488
MISSOURI, UNIV. OF COLUMBIA	REMOVAL OF VIRUS FROM PUBLIC WATER SUPPLIES	O'CONNOR, JOHN T.	80490301	NEW	76/09/27	$295,323
WASHINGTON UNIV. ST. LOUIS	SULFUR BUDGET IN LARGE PLUMES	HUSAR, R. B.	80389601	INCR	76/08/09	$108,000
			80389601	INCR	76/09/15	$25,000
			80389601	INCR	76/09/29	$35,000
WASHINGTON UNIV. ST. LOUIS	DEVELOP A PHYSICALLY BASED NUTRIENT & PESTICIDE TRANSPORT MODEL FOR ARTIFICALLY DRAINED CROPLAND	COMMONER, B.	80479401	NEW	76/08/31	$262,414
** TRAINING **						
LEAGUE OF WOMEN VOTERS ST. LOUIS	HAZARDOUS WASTE LEGISLATURE CONFERENCE	WISON, BETTY E.	90061101	NEW	76/07/08	$9,181
MISSOURI DEPT OF NATURAL RESOURCES JEFFERSON CITY	WTR POLLUTION CONTROL STATE OPERATION TRAINING GRANT	WILSON, JAMES L DIRECT	00705301	INCR	76/09/17	$5,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	MISSOURI					
** TRAINING **						
PENN VALLEY COMMUNITY COLLEGE KANSAS CITY	BASIC OPERATOR TRAINING COURSE	STEVENS, DR LEE A	00708001	INCR	76/07/08	$2,023
WATER AND WASTEWATER TECHNICAL SCHOOL NEOSHO	EVALUATION OF TRAINEES OF NPDES PROGRAM	LAYTON, RONALD F PRES	00709701	NEW	76/09/09	$2,480

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD

M O N T A N A

** RESEARCH **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
MONTANA COLLEGE OF MINERAL SCI. BUTTE	INVESTIGATION OF NEW TECHNIQUES FOR CONTROL OF SMELTER ARSENIC FLUE DUST WASTES	GALE, G. D.	R0459501	INCR	76/09/30	$25,830
MONTANA DEPT OF HEALTH & SCIENCES HELENA	AIR QUALITY MONITORING IN ENERGY AREAS & ASSESSMENT OF IMPACTS OF SURFACE MINING IN ALLUVIAL VALLEYS	A. C. KNIGHT, ACTING D	00811502	NEW	76/07/29	$60,000
			00811502	INCR	76/09/30	$28,540
MONTANA STATE UNIV. BOZEMAN	EFFECTS ON SURFACE CONFIGURATION IN WATER POLLUTION CONTROL ON SEMIARID MINED LANDS	HUFFMAN, R. E.	R0307903	CONT	76/09/14	$258,474
MONTANA STATE UNIV. BOZEMAN	MONITORING PLANT COMMUNITY CHANGES DUE TO FOSSIL POWER PLANTS IN EASTERN MONTANA	TAYLOR, J. E.	R0332203	CONT	76/07/30	$47,727
MONTANA, UNIV. OF MISSOULA	INVESTIGATION OF THE BIOENVIRONMENTAL IMPACT OF FOSSIL FUEL POWER PLANTS IN THE FORT UNION BASIN	GORDON, C. C.	R0321503	CONT	76/09/30	$80,000

** DEMONSTRATION **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
MONTANA DEPT OF HEALTH & SCIENCE HELENA	N & RESOURCE RECOVERY GRANT MONTANA SOLID WASTE MANAGEMENT, ENERGY CONSERV	A. C. KNIGHT, ACTING D	00816401	NEW	76/07/27	$81,093

NEBRASKA

** RESEARCH **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
CREIGHTON UNIV. OMAHA	OZONE EXPOSURE AND PULMONARY METABOLIC EFFECTS OF MEDIATORS AND HORMONES	WELLS, T. C.	R0458501	NEW	76/09/16	$35,057

** FELLOWSHIPS **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
NEBRASKA, UNIV. OF LINCOLN	APC/ENVRN. HEALTH	NELSON, JOHN M.	91052201	INCR	76/09/30	$904
NEBRASKA, UNIV. OF LINCOLN	M.S./SAN. ENGR.	BUHRMAN, R. C.	91081001	INCR	76/08/26	$57

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
N E V A D A						
** RESEARCH **						
SPARKS, CITY OF SPARKS	RESEARCH EVALUATION OF PHOSTRIP PROCESS	CHURN, ROBERT	R0893101	NEW	76/09/23	$113,780
** DEMONSTRATION **						
NEVADA DEPT OF HUMAN RES CARSON CITY	NEVADA SOLID WASTE PROGRAM	M. LAVERNE ROSSE	00909201	INCR	76/07/01	28,750

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
N E W H A M P S H I R E						
** RESEARCH **						
NEW HAMPSHIRE, UNIV. OF DURHAM	VIRUS CARRIAGE STATUS IN THE HARD SHELL CLAM	METCALF, T. G.	R0488201	NEW	76/08/17	$31,594
** DEMONSTRATION **						
A. C. LAWRENCE LEATHER CO. WINCHESTER	DEMONSTRATION OF A PROCESS TO MEET BEST AVAILABLE TREATMENT STANDARDS FOR CHROME TANNERY WASTES	BARBER, L.K.	R0450401	NEW	76/08/23	$149,140
** TRAINING **						
NEW ENGLAND MUN. CTR. DURHAM	SAFE DRINKING WATER ACT INFORMATION & TRAINING PROGRAM	VAN ASSELT, KARL	90063301	NEW	76/09/30	$25,600
NEW HAMPSHIRE, STATE OF CONCORD	LAB TRAINING FOR WATER & WWT PERSONNEL	RICHARD P. GROSSMAN	00110201	NEW	76/07/12	$16,250
NEW HAMPSHIRE, STATE OF CONCORD	MANPOWER STUDY & TRAINING OFFICER	WILLIAM A HEALY, P.E.	00113401	NEW	76/09/29	$7,500
** FELLOWSHIPS **						
FRANKLIN PIERCE LAW CENTER CONCORD	JURIS DOCTOR	MCEVOY, A. P.	91088001	NEW	76/09/30	$5,575

N E W   J E R S E Y

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
** RESEARCH **						
AMERICAN ELECTROPLATERS SOCIETY, INC. EAST ORANGE	ACTIVE TRANSPORT SYSTEMS FOR CONTROL OF HEAVY METAL POLLUTANTS IN METAL FINISHING SOLUTIONS	BAKER, R. W.	R0468201	NEW	76/09/16	$16,910
EDGEWATER, BOROUGH OF EDGEWATER	UPGRADING PRIMARY TANKS WITH ROTATING BIOLOGICAL CONTACTORS	COLLINS, DAVID P.	R0485401	NEW	76/09/13	$124,000
MONTCLAIR STATE COLLEGE UPPER MONTCLAIR	LABORATORY STUDY OF SURVIVAL & RECOVERY OF BACTERIA IN SEDIMENTS FROM THE N. Y. BIGHT	KODITSCHEK, LEAH	R0433801	NEW	76/09/27	$24,458
NEW JERSEY INST. OF TECH. FDN. NEWARK	REMOVAL & RECOVERY OF FLUOROBORATES FROM ELECTROPLATING WASTEWATER	LISKOWITZ, J.	R0471001	NEW	76/09/08	$52,200
NEW JERSEY INST. OF TECHNOLOGY NEWARK	FIELD INSTRUMENT FOR CONTINUOUS ON STACK MONITORING MASS CONCENTRATION OF PARTICULATES IN STACK EMIS	LISKOWITZ, JOHN	R0350902	CONT	76/08/04	$65,000
NORTHWEST BERGEN CNTY. SEWER AUTH. WALDWICK	ULTRAVIOLET DISINFECTION OF SECONDARY SEWAGE TREATMENT PLANT EFFLUENT	HOLLANDER, C. W.	R0488001	NEW	76/09/14	$224,806
PRINCETON UNIV. PRINCETON	USE OF SIMULATION FOR CHARACTERIZING TRANSPORT IN SOILS ADJACENT TO LAND DISPOSAL SITES	PINDER, G. F.	R0382702	CONT	76/09/23	$41,140
PRINCETON UNIV. PRINCETON	MEASUREMENT OF NATIONAL BENEFITS OF WATER QUALITY IMPROVEMENTS	MILLS, E. W.	R0506501	NEW	76/09/30	$143,000
RUTGERS UNIV. NEW BRUNSWICK	QUANTITATION OF DESORPTION RECOVERY OF BACTERIA FROM SEDIMENT & PARTICULATE MATTER IN THE OCEAN	LITCHFIELD, C. D.	R0486501	NEW	76/09/16	$26,515
** DEMONSTRATION **						
E.I. DUPONT DE NEMOURS & CO., INC. DEEPWATER	CHAMBERS WORKS WASTEWATER TREATMENT PLANT-REMOVAL ORGANICS ORGANO-NITROGEN COMPOUNDS FROM WASTEWATER	HEATH, HARRY W.	R0494301	NEW	76/09/30	$87,000

NEW JERSEY

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
** DEMONSTRATION **						
MIDDLESEX CNTY. NEW BRUNSWICK	MIDDLESEX COUNTY RESOURCE RECOVERY/"208" MODEL PROGRAM	O'NEILL, THEODORE F.	R04R1001	NEW	76/09/13	$100,000
** TRAINING **						
NJ DEPT ENVIRONMENTAL PROTECTION TRENTON	TRNG FOR OPERATING PERSONNEL	SIDNEY YTKIN, DIR	00213201	INCR	76/07/12	$16,621
RUTGERS UNIV. NEW BRUNSWICK	AIR RESOURCES MANAGEMENT AND TRAINING PROGRAM	KAPLOVSKY, A. JOEL	90055302	CONT	76/09/08	$55,600
** FELLOWSHIPS **						
COOK COLLEGE/RUTGERS UNIV. NEW BRUNSWICK	M.S./ENVRN. SCIENCE	DIGENOVA, FRANCIS J.	91060901	INCR	76/07/30	$886

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
NEW MEXICO						
** TRAINING **						
EASTERN NEW MEXICO UNIVERSITY PORTALES	AUTO EMISSION CONTROL & TUNE UP	DON WILSON, TRADE & IN	00612801	NEW	76/09/30	$10,940
NEW MEXICO STATE UNIVERSITY LAS CRUCES	OJT FOR WWT PLANT OPERATORS IN SE QUADRANT OF NEW MEXICO	ALEX A SANCHEZ DIRECTO	00612701	NEW	76/07/26	$19,980

NEW YORK

** RESEARCH **

APPLICANT MUNICIPALITY	PROJECT DIRECTOR / FELLOW TITLE	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
ASSOCIATED UNIVERSITIES, INC. UPTON	VAUGHN, J. FATE OF HUMAN VIRUSES IN GROUNDWATER RECHARGE SYSTEMS UTILIZING TERTIARY TREATED EFFLUENTS	80477601	NEW	76/08/27	$100,000
CARBORUNDUM CO. NIAGARA FALLS	FLUEGGE, R. A. EFFECTIVENESS OF CHLORINE,OZONE & ULTRAVIOLET LIGHT IN ELIMINATING VIRUS FROM WASTEWATER EFFLUENTS	80499101	NEW	76/09/27	$160,000
CLARKSON COLLEGE POTSDAM	DEPINTO, J. V. KINETIC STUDIES OF DECOMPOSITION & NUTRIENT REGENERATION OF GREAT LAKES PHYTOPLANKTON	80493701	NEW	76/09/29	$85,000
CLARKSON COLLEGE OF TECHNOLOGY POTSDAM	KERKER, M. QUANTATIVE CHEMICAL ANALYSIS OF PRTICULATES BY RAMAN SPECTROSCOPY	80465901	NEW	76/09/24	$28,000
COLUMBIA UNIV. NEW YORK	SIMPSON, H. J. DREDGE SPOILS & SEWAGE SLUDGE IN TRACE METAL BUDGET OF ESTUARINE & COASTAL WATERS	80311303	CONT	76/08/06	$74,000
CORNELL UNIV. GENEVA	ROELOFOL, WENDELL STRATEGY OF INSECT CONTROL USING MATING DISRUPTION	80363401	NEW	76/08/06	$50,244
CORNELL UNIV. ITHACA	MCLAFFERTY, F. W. IMPROVEMENTS TO PROBABILITY BASED MATCHING FOR UNKNOWN MASS SPECTRA	80450901	NEW	76/07/30	$50,846
CORNELL UNIV. ITHACA	JEWELL, W. J. AUTOHEATED AEROBIC THERMOPHILIC DIGESTION WITH AIR AERATION	80463601	NEW	76/09/14	$93,820
CORNELL UNIV. ITHACA	FRANCIS, J. D. NATIONAL STATISTICAL ASSESSMENT OF DOMESTIC RURAL WATER	80490001	NEW	76/09/14	$315,758
CORNELL UNIV. ITHACA	LOEHR, RAYMOND C. EFFECTIVENESS OF SOIL & WATER CONSERVATION PRACTICES FOR POLLUTION CONTROL	80492501	NEW	76/09/16	$257,246

N E W   Y O R K

** RESEARCH **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
FORDHAM UNIV. BRONX	BIOLOGICAL ANALYSIS PRI PRODUCTIVITY & RELATED PROCESSES NY HARBOR REFLECTIVE CHANGING WATER QUALITY	MCLAUGHLIN, J. A.	80337003	CONT	76/09/14	$271,320
GRUMMAN AEROSPACE CORP. BETHPAGE	DEVELOPMENT OF REDUCED POLLUTION CORROSION PROTECTION SYSTEMS	STAEBLER, CHRISTIAN	80433101	NEW	76/07/02	$52,000
NASSAU CNTY. MINEOLA	SECONDARY TREATMENT USING FLUIDIZED BED TECHNOLOGY	FLOOD, F.	80465401	NEW	76/08/26	$100,000
NEW YORK DEPT. OF HEALTH ALBANY	VIRUS SOIL INTERACTIONS	PARHAM, T. W.	80474301	NEW	76/09/30	$214,489
NEW YORK STATE DEPT. ENVRN. CONSERV. ALBANY	DIFFUSION ANALYSIS OF A LINE SOURCE	RAO, S. T.	80457901	NEW	76/08/23	$77,703
NEW YORK STATE DEPT. OF ENVRN. CONSERV ALBANY	SULFATE & PARTICULATE EMISSIONS FROM IN-USE CATALYST VEHICLES	GIBBS, RICHARD E.	80352002	INCR	76/09/13	$35,750
NEW YORK STATE DEPT. OF HEALTH ALBANY	COMPARATIVE KINETIC STUDIES OF NUTRIENT UPTAKE & GROWTH IN GREAT LAKES PHYTOPLANKTON	PARHAM, T. W.	80468901	NEW	76/07/08	$50,000
NEW YORK STATE UNIV. ALBANY	ELIMINATE PHENOLIC & CHLOROPHENOLIC MATERIAL SPENT CHLORINATION & CAUSTIC EXTRACTION BLEACH LIQUORS	DENCE, C.	80477901	NEW	76/08/26	$86,530
NEW YORK STATE UNIV. RES. FDN. ALBANY	IMPACT OF ZOOPLANKTON GRAZING UPON PHYTOPLANKTON IN EUTROPHIC SAGINAW BAY & WESTERN LAKE ERIE	MCNAUGHT, D. C.	80457301	INCR	76/09/23	$2,000
NEW YORK, UNIV. OF NEW YORK	FEASIBILITY STUDY ON EXECUTIVE PROGRAM DEVELOPMENT FOR BASIN ECOSYSTEM MODELING	BOUVER, H.	80463701	NEW	76/07/02	$17,938

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	NEW YORK					
** RESEARCH **						
NEW YORK, UNIV. OF ALBANY	ASSESSMENT OF IMPACT OF POLLUTION CONTROL ON EUTROPHICATION OF EASTERN BASIN OF LAKE ERIE	SWEENEY, R. A.	80465801	NEW	76/07/16	$50,000
			80465801	INCR	76/09/23	$40,000
RENSSELAER POLYTECHNIC INST. TROY	LONG TERM RECHARGE OF TRICKLING FILTER EFFLUENT INTO SAND	AULENBACH, DONALD	80345201	INCR	76/08/23	$10,315
RENSSELAER POLYTECHNIC INST. TROY	MODELING TRANSPORT & BEHAVIOR OF PESTICIDES & OTHER TOXIC ORGANIC MATERIALS IN AQUATIC ENVIRONMENTS	PARK, RICHARD A.	80482001	NEW	76/08/10	$101,400
ST. LAWRENCE E. ONTARIO COMM. WATERTOWN	DAMAGE ASSESSMENT STUDIES FOLLOWING ALEXANDRIA BAY OIL SPILL	TYSON, W. E.	80503101	NEW	76/09/30	$119,490
SYRACUSE RES. CORP. SYRACUSE	MONITORING OF POLYNUCLEAR AROMATIC HYDROCARBONS IN SELECTED U.S. WATERS	SAXENA, JITENDRA	80397702	CONT	76/07/21	$56,225
SYRACUSE RES. CORP. SYRACUSE	EFFECTS & FATE OF SEWAGE-EFFLUENT CHLORINATION PRODUCTS IN PHYTOPLAKTON	SIKKA, H. C.	80493801	NEW	76/09/23	$50,000
SYRACUSE RES. FDN. SYRACUSE	APPROACHES TO PRESERVATION OF CONTAMINANTS IN WATER SAMPLES	SAXENA, J.	80460901	NEW	76/08/10	$32,410
SYRACUSE RESEARCH CORP. SYRACUSE	FATE 3,3' DICHLOROBENZIDINE IN THE AQUATIC ENVIRONMENT	SIKKA, H. C.	80458401	NEW	76/08/10	$64,988
SYRACUSE RESEARCH CORP. SYRACUSE	INTRODUCING NEW TECHNOLGY TO MUNICIPAL WASTE TREATMENT	LAMBRIGHT, W. H.	80478201	NEW	76/09/28	$57,587

N E W Y O R K

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
** RESEARCH **						
SYRACUSE UNIV. SYRACUSE	DEVELOPMENT OF METHODS FOR QUANTITAION OF ADSORBED VIRUSES IN WASTE AND OTHER WATER	SMITH, J.	80377402	CONT	76/07/09	$25,878
SYRACUSE UNIV. SYRACUSE	EVALUATION OF ANAEROBIC FILTER AS A DIVICE FOR TREATING PHARMACEUTICAL WASTES	JENNETT, J. CHARLES	80442801	INCR	76/07/16	$25,000
SYRACUSE UNIV. SYRACUSE	EVALUATION OF ALGAL MEANDER SYSTEM AS TECHNIQUE ABATING POLLUTION FROM SECONDARY LEAD SMELTERS	JENNETT, J. C.	80473401	NEW	76/08/26	$26,319
UNION COLLEGE SCHENECTADY	DOCUMENTATION OF SELECTED CONDITIONS BEFORE-AFTER RESTORATIVE DREDGING	GEORGE, C. J.	80457201	NEW	76/07/22	$59,577
** DEMONSTRATION **						
GENERAL ELECTRIC CO. HUDSON FALLS	DEMONSTRATION OF A POLYCHLORINATED BIPHENYL PROCESSING AND MANUFACTURING WASTE TREATMENT PROCESS	MODAN, M.	80490101	NEW	76/09/24	$118,564
NEW YORK STATE DEPT. OF ENVRN. CONSERV ALBANY	TREATMENT OF NON-POINT SOURCE CONTAMINATION IN LAKE RONKONKOMA, NY BY BIO-FILTRATION	ANDRES, BARRY	80483501	NEW	76/09/29	$334,048
** TRAINING **						
CONFERENCE OF STATE SAN. ENGR. TROY	COURSE FOR NON-COMMUNITY SYSTEMS	THOMPSON, M.	90062201	NEW	76/09/27	$25,085
CONFERENCE OF STATE SANITARY ENGINEERS TROY	DETERMINE SURVEY STUDY AND COMPILE DATA AND MATERIALS RELATING TO TRAINING OF PERSONNEL OF WATER SYS	THOMPSON, M.	90062001	NEW	76/08/23	$20,000
CONFERENCE OF STATE SANITARY ENGINEERS TROY	DESIGN AND MAINTENANCE MANUAL FOR SMALL WATER SYSTEMS	GROSSMAN, IRVING	90062401	NEW	76/08/26	$25,570

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
		N E W Y O R K				
** TRAINING **						
CORNELL UNIV. ITHACA	EDUCATION RELATED TO THE LAND DISPOSAL OF WASTES	LOEHR, RAYMOND	90050002	INCR	76/09/29	$65,000
CORNELL UNIV. ITHACA	EXAMINATION, CRITIQUE AND TRAINING IN THE PLANNING PROCESSES UNDER SECTION 208 OF PL92-500	DWORSKY, L. B.	90062601	NEW	76/09/30	$15,464
N.Y.C. DEPT OF WATER RESOURCES NEW YORK CITY	TRAINING FOR STP OPFRATORS	JOSEPH T MILLER, PE	00214401	NEW	76/09/30	$15,709
NEW YORK POLYTECHNIC INST. BROOKLYN	WATER SUPPLY & POLLUTION CONTROL ENGINEERING	MOLOF, ALAN H.	90019406	INCR	76/07/01	$33,475
NEW YORK STATE DEPT. ENVRN. CONSERV. ALBANY	DEMONSTRATION OF A TWO YEAR AAS WATFR QUALITY MONITORING PROGRAM	CAMPBELL, DANIEL J.	90054001	INCR	76/07/30	$68,000
			90054001	INCR	76/09/27	$20,000
NEW YORK STATE DEPT. OF ENVRN. CONSERV ALBANY	DEVELOPMENT OF A MODEL PLAN OF OPERATIONS FOR MUNICIPAL WASTEWATER TREATMENT FACILITIES	CAMPBELL, DANIEL J.	90063501	NEW	76/09/29	$29,597
NYS DEPT OF ENVIRONMENTAL CONSERVATION ALBANY	OPERATUR DEVELOPMENT SYSTEM	PETER AA BERLE, COMM	00214301	NEW	76/09/23	$28,270
** FELLOWSHIPS **						
COOPER UNION NEW YORK	M.S./PLANNING & MGMT.	WATKINS, HENRY C.	91074201	NEW	76/09/28	$3,587
COOPER UNION NEW YORK	M.S./PLANNING & MGMT.	SANDERS, HARRIS J.	91075101	NEW	76/09/27	$3,587

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
N E W Y O R K						
** FELLOWSHIPS **						
COOPER UNION NEW YORK	ENVRN. STUDIES	RUBINSTEIN, SEYMOUR C.	91077001	NEW	76/09/29	$2,387
COUPER UNION NEW YORK	ENVRN. STUDIES	SANCHEZ, ALBERT	91077101	NEW	76/09/29	$420
COOPER UNION NEW YORK	M.S./ENVRN. ENGR.	DIACATUS, P.	91077201	NEW	76/09/28	$3,587
COPPER UNION NEW YORK	M.S./ENVRN. ENGR.	ROTH, PAUL M.	91076701	INCR	76/07/02	$1,967
RENSSELAER POLYTECHNIC INST. TROY	M.S./URBAN AND ENVIRONMENTAL STUDIES	NAPIER, D. L.	91079001	NEW	76/09/29	$1,501
RENSSELAER POLYTECHNIC INST. TROY	M.S.	PEDDADA, A.	91082701	NEW	76/09/30	$1,501
RENSSELAER POLYTECHNIC INST. TROY	M.S.	ECKEL, M. L.	91088501	NEW	76/09/24	$5,724
SYRACUSE UNIV. SYRACUSE	M.S.	DALIA, R. R.	91091201	NEW	76/07/30	$440

N O R T H   C A R O L I N A

** RESEARCH **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
AMERICAN TEXTILE MANUFACTURING INST. CHARLOTTE	TECHNICAL & ECONOMIC EVALUATIONS OF BATEA GUIDELINES-TEXTILES	NILES, O'JAY	80432901	INCR	76/09/29	$183,000
DUKE UNIV. DURHAM	STUDIES RELATED TO ORGANIC CHEMICAL ANALYSIS OF INDUSTRIAL SAMPLES	LOCKMULLER, C.	80458901	NEW	76/09/14	$15,947
DUKE UNIV. DURHAM	EVALUATION OF EMISSION OF NATURAL HYDROCARBONS FROM FOREST VEGETATION BY MICROMETEOROLOGICAL METHODS	KNOERR, KENNETH R.	80486001	NEW	76/09/09	$20,000
DUKE UNIV. MARINE LAB. BEAUFORT	EFFECTS OF INSECT GROWTH REGULATORS & JUVENILE HORMONE MIMICS ON CRUSTACEAN DEVELOPMENT	COSTLOW, JOHN D.	80383802	CONT	76/09/30	$48,704
NORTH CAROLINA CENTRAL UNIV. DURHAM	EVALUATION OF THE MUTAGENIC POTENTIALS OF PLATINUM COMPOUNDS	SANDHU, S. S.	80329903	CONT	76/08/09	$38,921
NORTH CAROLINA STATE UNIV. RALEIGH	MATHEMATICAL TECHNIQUES FOR X-RAY ANALYZERS	GARDNER, ROBIN	80275903	INCR	76/08/04	$15,000
NORTH CAROLINA STATE UNIV. RALEIGH	BASIC STUDIES OF BOUNDARY LAYER FLOW & DIFFUSION OVER SMALL SCALE TOPOGRAPHY	ARYA, SATYA PAI SINGH	80465301	NEW	76/08/26	$50,000
NORTH CAROLINA STATE UNIV. RALEIGH	TEST & EVALUATION OF A PILOT PLANT COAL GASIFIER - GAS CLEANING FACILITY	FERREL, JAMES K.	80481101	NEW	76/09/13	$481,349
NORTH CAROLINA STATE UNIV. RALEIGH	NON-POINT SOURCE MODEL: WATERSHED INPUT FROM AREAS RECEIVING ANIMAL WASTES	OVERCASH, M. R.	80501101	NEW	76/09/23	$82,487
			80501101	INCR	76/09/30	$82,487

N O R T H   C A R O L I N A

** RESEARCH **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
NORTH CAROLINA, UNIV. OF CHAPEL HILL	OUTDOOR SIMULATION OF AIR POLLUTION CONTROL STRATEGIES	JEFFRIES, HARVEY E.	R0091604	INCR	76/09/28	$6,869
NORTH CAROLINA, UNIV. OF CHAPEL HILL	EFFECT OF ETIOLOGICAL-DEFINED RESPIRATORY INFECTIONS ON LUNG FUNCTION,GROWTH LOW AIR POLLUTION	COLLIER, ALBERT M.	80223303	INCR	76/07/21	$30,516
NORTH CAROLINA, UNIV. OF CHAPEL HILL	EXPERIMENTAL STUDY OF AEROSOL FORMATIONS IN A CONTROLLED ATMOSPHERE	FOX, D. L.	80247203	CONT	76/07/30	$49,784
NORTH CAROLINA, UNIV. OF CHARLOTTE	STUDY OF CONVERTER MATERIALS & ORGANIC NITROGEN INTERFERENCE IN NO-NO2 MONITORS	COOKE, WILLIAM M.	80441301	NEW	76/09/27	$25,000
NORTH CAROLINA, UNIV. OF CHAPEL HILL	EFFECT ETIOLOGICALLY DEFINED RESPRIRATORY INFECTIONS LUNG FUNCTIONS & GROWTH AREA LOW AIR POLLUTION	COLLIER, A. M.	R0457701	NEW	76/09/27	$231,055
NORTH CAROLINA, UNIV. OF CHAPEL HILL	EFFECTS OF VIRUS PARTICLE AGGREGATION ON DISINFECTION OF WATER SUPPLIES	SHARP, D. G.	80463501	NEW	76/08/23	$99,997
NORTH CAROLINA, UNIV. OF CHAPEL HILL	DETECTION OF CARCINOGENICITY OF OIL IN SEAWATER	HUMM, D. G.	R0465001	NEW	76/08/04	$41,150
NORTH CAROLINA, UNIV. OF CHAPEL HILL	ULTRAVIOLET DISINFECTION OF FILTERED AND UNFILTERED SECONDARY WASTEWATER	JOHNSON, D. J.	80477001	NEW	76/09/08	$114,000
NORTH CAROLINA, UNIV. OF RALEIGH	EFFECTS OF LARGE SCALE AGRICULTURAL LAND DEVELOPMENT ON DRAINAGE WATERS	SKAGGS, R. W.	80477801	NEW	76/09/16	$48,000
NORTH CAROLINA, UNIV. OF CHAPEL HILL	ASSESSMENT & CONTROL OF WASTEWATER CONTAMINANTS ORIGINATING FROM THE PRODUCTION OF SYNTHETIC FUELS	SINGER, PHILIP C.	R0491701	NEW	76/09/27	$130,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	N O R T H C A R O L I N A					
** RESEARCH **						
NORTH CAROLINA, UNIV. OF CHAPEL HILL	UPTAKE & RELEASE OF HAZARDOUS SUBSTANCES BY SUSPENDED MATERIALS & SEDIMENT IN LAKES	SINGER, P.	80494401	NEW	76/09/23	$129,000
NORTH CAROLINA, UNIV. OF CHAPEL HILL	CARBON MONOXIDE AND ACCELERATED ATHEROSCLEROSIS	BRINKHUUS, K. M.	80495901	NEW	76/09/28	$88,910
RESEARCH TRIANGLE INST. RES TRIANGLE PK	POLLUTANTS FROM SYNTHETICS FUELS PRODUCTION	MIXON, F. O.	80497901	NEW	76/09/30	$300,000
SAINT AUGUSTINE'S COLLEGE RALEIGH	LIFE SPAN EFFECTS OF LOW LEVEL HTO EXPOSURE DURING PREGNANCY IN RATS	JOHNSON, W. W.	80376402	CONT	76/09/15	$27,362
ST. AUGUSTINES COLLEGE RALEIGH	LIFE SPAN EFFECT OF LOW LEVEL HTO EXPOSURE DURING PREGNANCY IN RATS	JOHNSON, W. W.	80376401	INCR	76/08/10	$7,125
** TRAINING **						
NORTH CAROLINA, UNIV. OF CHAPEL HILL	PRACTITIONER TRAINING IN AIR POLLUTION	REIST, PARKER C.	90054502	CONT	76/08/30	$55,600
** FELLOWSHIPS **						
NORTH CAROLINA STATE RALEIGH	M. S./CIVIL ENGR.	ELMORE, W. L.	91095801	NEW	76/07/30	$4,687
			91095801	INCR	76/09/29	$180

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	NORTH DAKOTA					
** RESEARCH **						
NORTH DAKOTA DEPT OF HEALTH BISMARCK	COLLECTION OF AMBIENT AIR BASELINE DATA FROM THE E	GENE A. CHRISTIANSON,	00812702	CONT	76/09/30	$54,800
NORTH DAKOTA REG. ENVIR. ASSESS. PROG. BISMARCK	PHASE II USER NEEDS FOR REAP OUTPUT	DR. A. WILLIAM JOHNSON	00818101	NEW	76/09/30	$15,000
NORTH DAKOTA STATE UNIVERSITY FARGO	DIMENTS IN KNIFE RIVER BASIN N. D. CHEMICAL AND BACTERIOLOGICAL ANALYSIS OF STREAM SE	ARLON HAZEN, DIRECTOR	00816301	NEW	76/08/09	$19,518
** TRAINING **						
NORTH DAKOTA STATE BISMARCK	WASTEWATER OPERATO	WILLIS VAN HEUVELE	00817401	NEW	76/08/31	$15,000

O H I O

** RESEARCH **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
AKRON, UNIV. OF AKRON	THE EFFECTS OF AIR POLLUTION: A LONGITUDINAL - CROSS SECTIONAL APPROACH	MOSTARDI, RICHARD A.	80425601	NEW	76/09/29	$162,036
CENTRAL STATE UNIV. WILBERFORCE	EVALUATION OF TEKMAR LSC-1 VOLATILES SAMPLER	SMITH, L. S.	80472301	NEW	76/09/08	$28,866
CHILDREN'S HOSPITAL COLUMBUS	A LONGITUDINAL EVALUATION OF LEAD BODY BURDEN IN GROWING CHILDREN	LUBIN, A. HAROLD	80416801	INCR	76/09/24	$48,957
DAYTON, UNIV. OF DAYTON	LAB. EVALUATION OF THERMAL DECOMPOSITION OF PESTICIDES	DUVALL, DONOVAN S.	80354001	INCR	76/08/26	$14,133
DAYTON, UNIV. OF DAYTON	INVESTIGATION OF CONCEPTS FOR IMPROVING THE FUEL FRACTION OF SHREDDED SOLID WASTE	HECHT, NORMAN L.	80442101	NEW	76/08/13	$112,077
FARM BUREAU DEVELOPMENT CORP. COLUMBUS	INFLUENCE OF VARIOUS EDUC. METHODS ON ATTITUDES OF RESIDENTS TOWARD LAND DISPOSAL SEWAGE SLUDGE	HILL, J. K.	80470301	NEW	76/09/08	$75,000
MAHONING CNTY. BD. OF COMM. YOUNGSTOWN	EVALUATION OF OZONATION SYSTEM FOR WASTEWATER DISINFECTION	FITAS, MICHAEL	80446001	INCR	76/09/08	$212,407
NATIONAL WATER WELL ASSOC. WORTHINGTON	INDIVIDUAL WATER SUPPLY TREATMENT TECHNOLOGY MANUAL	LEHR, J. H.	80478101	NEW	76/08/26	$49,800
OHIO AGRI. RES. & DEVELOPMENT CTR. WOOSTER	LIVESCTOCK PASTURING ON NON POINT SURFACE RUNNOFF	DAVIS, R. R.	80463101	NEW	76/09/29	$88,628
OHIO MENTAL HEALTH CLEVELAND	BIOLOGICAL INDICATOR OF SUMMATIONAL EXPOSURES TO LEAD AND OTHER METALS	KELSALL, M. A.	80463201	NEW	76/08/10	$39,258

OHIO

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
** RESEARCH **						
OHIO RIVER VALLEY WATER SAN. COMM. CINCINNATI	ORGANIC SUBSTANCES IN OHIO RIVER & ASSOCIATED WATER SUPPLIES	BOES, R. J.	80461501	NEW	76/09/15	$150,000
OHIO STATE UNIV RES FDN COLUMBUS	MAUMEE RIVER PILOT WATERSHED STUDY/LUCAS, DEFIANCE & WOOD CNTYS.	KENNETH W SLOAN, EX DI	00514501	INCR	76/08/11	$86,172
OHIO STATE UNIV. COLUMBUS	LIMNOLOGICAL INVESTIGATIONS OF WATER QUALITY & FISH LARVAE IN LAKE ERIE	HERNDENDORF, C. E.	80461201	INCR	76/09/17	$75,000
OHIO STATE UNIV. COLUMBUS	ASSESSMENT OF IMPACTS OF ENERGY CONVERSION ON THE ENVIRONMENT OF THE OHIO RIVER BASIN	STIEFEL, ROBERT C.	80485101	NEW	76/07/29	$96,867
OHIO STATE UNIV. RES. FDN. COLUMBUS	EFFECTS OF SELENIUM IN DRINKING WATER ON DEPOSITION,METABOLISM & GLUTATHIONE PEROXIDASE ACTIVITY	COURI, D.	R0375502	CONT	76/08/06	$49,936
OHIO STATE UNIV. RES. FDN. COLUMBUS	APPLICATION OF FOURIER TRANSFORM SPECTROSCOPY TO AIR POLLUTION PROBLEMS	SHAW, JOHN H.	R0386802	CONT	76/07/07	$90,000
** TRAINING **						
CINCINNATI, UNIV. OF CINCINNATI	GRADUATE TRAINING IN AIR POLLUTION	SALTZMAN, BERNARD E.	90022808	CONT	76/08/30	$55,600

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
O K L A H O M A						
** RESEARCH **						
LANGSTON UNIV. LANGSTON	RECLAMATION OF HEAVY-METAL CONTAMINATED SOILS	FRANKS, W. A.	80432301	NEW	76/09/16	$55,000
OKLAHOMA AGRIC. EXPERIMENT STA STILLWATER	BIO ORGANIC INDICATORS OF GROUND WATER POLLUTION	MORRILL, L. G.	80461301	NEW	76/07/16	$138,806
OKLAHOMA STATE DEPT. OF HEALTH OKLAHOMA CITY	SPRAY-RUNOFF TREATMENT OF MUNICIPAL WASTEWATER	KEENE, FORREST	80321801	INCR	76/09/13	$124,178
OKLAHOMA STATE UNIV. STILLWATER	A PROJECT TO DEVELOP & EVALUATE AN ENVIRONMENTAL TECHNOLOGY TRANSFER SYSTEM	FITE, ROBERT C.	80484701	NEW	76/09/24	$125,000
OKLAHOMA, UNIV. OF NORMAN	ENVRN. IMPACT ASSESSMENT METHODOLOGIES FOR OECD UTILIZING INTERNAT'L RESIDUALS COEFFICIENT MATRIX	DEVINE, MICHAEL D.	80482201	NEW	76/08/17	$26,048
TULSA, UNIV. OF TULSA	ENVIRONMENTAL CONSERVATION IN PETROLEUM REFINING WASTEWATER TREATMENT	MANNING, F. S.	80496801	NEW	76/09/30	$30,349
** TRAINING **						
OKLAHOMA STATE DEPT HEALTH OKLAHOMA CITY	RADIATION CONTROL - ENVIRONMENTAL SURVEILLANCE TRAINING	J DALE MCHARD	00612201	NEW	76/09/30	$4,800
OSCAR ROSE JR COLLEGE MIDWEST CITY	WWT FACILITY OPERATOR TRAINING	DR ROBERT PARK	00612901	NEW	76/09/30	$15,000
** FELLOWSHIPS **						
OKLAHOMA, UNIV. OF NORMAN	M.S./CIVIL ENGR.	D'ANDREA, N. V.	91079701	NEW	76/07/08	$5,505

OREGON

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
** RESEARCH **						
OREGON GRADUATE CTR. FOR STUDY & RES. BEAVERTON	CONTINUOUS MONITORING OF PARTICULATE SULFUR COMPOUNDS BY FLAME PHOTOMETRY	HUNTZICKER, J. J.	80475001	NEW	76/09/14	$29,980
OREGON STATE UNIV. CORVALLIS	LABORATORY DETERMINATION OF CHLORAMINE CONCENTRATIONS SAFE FOR AQUATIC LIFE	WARREN, CHARLES E.	80228603	INCR	76/09/27	$90,068
OREGON STATE UNIV. CORVALLIS	PROCEDURES BASED HEPATIC TOXICITIES EVALUATE EFFECTS CHRONIC EXPOSURE OF FISHES ENVRN. CONTAMINANTS	WEBER, L. J.	80309003	CONT	76/09/15	$21,816
OREGON STATE UNIV. CORVALLIS	MICROCOSM & THEORETICAL EVALUATION OF SUBSTITUTE CHEMICALS	WARREN, C. E.	80462201	NEW	76/09/16	$43,003
OREGON STATE UNIV. CORVALLIS	ABSORPTION CHARACTERISTIC OF PROLATE SPHEROIDAL MODEL OF MAN & AMINALS AT & NEAR RESONANCE FREQUENCY	WEIL, C. H.	80469701	NEW	76/08/10	$20,637
OREGON STATE UNIV. CORVALLIS	TRANSITION ZONE VEGETATION BETWEEN INTERTIDAL MARSH & UPLAND IN OREGON & WASHINGTON	FRENKEL, R. E.	80496301	NEW	76/09/16	$45,920
OREGON, UNIV. OF PORTLAND	DETERMINATION OF GIARDIA CYST VIABILITY	MEYER, E. A.	80489801	NEW	76/09/16	$41,983
PORTLAND STATE UNIV. PORTLAND	INVESTIGATION OF REACTIONS OF AROMATIC HYDROCARBONS IN PHOTOCHEMICAL AIR POLLUTION	O'BRIEN, R. J.	80476401	NEW	76/09/27	$18,000
** TRAINING **						
LINN-BENTON COMMUN COLLEGE ALBANY	WASTEWATER TECHNOLOGY	SCOTT, PETER C.	90012805	INCR	76/07/22	$15,000
LINN-BENTON COMMUN. COLLEGE ALBANY	TRAINING FOR N.P.D.E.S. SELF-MONITORING LABORATORY AND REPORTING PROCEDURES	SCOTT, PETER	90056101	INCR	76/07/16	$20,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	OREGON					
** TRAINING **						
LINN-BENTON COMMUNITY COLLEGE ALBANY	WATER POLLUTION CONTROL OPERATION TRAINING GRANT	VERNON E. FORNELL	00010901	INCR	76/09/30	$5,600
OREGON STATE UNIV. CORVALLIS	GRADUATE TRAINING IN AIR POLLUTION CONTROL	BOUBEL, R. W.	90053802	CONT	76/09/16	$41,700

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	P E N N S Y L V A N I A					
** RESEARCH **						
ACADEMY OF NATURAL SCIENCES PHILADELPHIA	INVESTIGATION OF ECOLOICAL FFFECTS OF RESIDUAL OZONE TO SELECTED ESTURAINE SPECIES	BURTON, D. T.	80468301	NEW	76/08/04	$80,000
DREXEL UNIV. PHILADELPHIA	MICROWAVE SYSTEM FOR LOCATING FAULTS IN HAZARDOUS MATERIAL DIKES: PARAMETER SPECIFICATION	KOERNER, R. M.	80476301	NEW	76/08/23	$20,000
FRANKLIN INST. PHILADELPHIA	PREPARATION OF INDUSTRIAL TECHNOLOGY BULLETIN VOL.4 & INPUT TO WRSIC DATA SERVICES	ORR, JANET	80446201	NEW	76/07/30	$50,927
FRANKLIN INST. RES. LABORATORIES PHILADELPHIA	PREPARATION OF THE MUNICIPAL TECHNOLOGY BULLETIN AND INPUT TO THE WRSIC DATA SERVICE	ORR, JANET	80492201	NEW	76/09/23	$58,302
PENNSYLVANIA STATE UNIV. UNIVERSITY PARK	SELECT RESEARCH GROUP IN AIR POLLUTION METEOROLOGY	THOMPSON, DENNIS W.	80039704	INCR	76/09/13	$186,394
PENNSYLVANIA, UNIV. OF PHILADELPHIA	CASE CONTROL STUDY OF WATER QUALITY & CARCINOGENISES IN PA.	BAHN, A.	80459401	NEW	76/09/17	$782,564
PITTSBURGH, UNIV. OF PITTSBURGH	SAFETY EVALUATION OF RENOVATED WASTEWATER	ANDELMAN, JULIAN B.	80428601	INCR	76/09/17	$26,675
** DEMONSTRATION **						
MATLACK, INC. LANSDOWNE	TRUCK WASHING TERMINAL WATER POLLUTION CONTROL	O'BRIEN, JOHN E.	80365601	INCR	76/07/16	$40,000
PENNSYLVANIA DEPT. OF ENVRN. RESOURCES HARRISBURG	DEMONSTRATE AND EVALUATE RECLAMATION STABILIZATION AND EROSION CONTROL OF STRIP MINED LAND	BUCCIARELLI, W. C.	80451101	NEW	76/09/29	$100,000
PENNSYLVANIA DEPT. OF ENVRN. RESOURCES HARRISBURG	USE OF FGD SLUDGES & FLY ASH TO ABATE MINE DRAINAGE & SUBSIDENCE	ERCOLE, J. ANTHONY	80484601	NEW	76/09/27	$108,554

②

P E N N S Y L V A N I A

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
** TRAINING **						
ASSOCIATION OF ENVRN. ENGR. PROFESSORS PHILADELPHIA	AQUATIC MICROBIOLOGY LABORATORY MANUAL-A LABORATORY TEXT	PIPES, WESLEY O.	90045701	INCR	76/08/04	$7,020
DEPT OF COMMUNITY AFFAIRS HARRISBURG	WATER POLLUTION CONTROL TRAINING	ZIGMENT, ANTHONY JR.	00310802	INCR	76/09/29	$7,500
PENNSYLVANIA DEPT COMM AFFAIRS HARRISBURG	ENVIRONMENTAL LAWS & PROGRAM TRAINING MANUAL	KLAUSE, GEORGE	00312601	NEW	76/09/29	$20,000
PENNSYLVANIA DEPT. OF COMM. AFFAIRS HARRISBURG	TO CONDUCT AN INSTRUCTOR TRAINING COURSE IN ST.OF WATER POLLUTION CONTROL TRAINING TO CONDUCT AN INS	ZIGMENT, ATHONY J.	00312801	NEW	76/09/30	$1,200
PENNSYLVANIA STATE UNIV. UNIVERSITY PARK	AIR POLLUTION STUDENT LOAN PROGRAM	ENGEL, ALFRED J.	90059801	NEW	76/08/30	$55,600

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	R H O D E I S L A N D					
** RESEARCH **						
RHODE ISLAND, UNIV. OF KINGSTON	STABILITY RESILIENCY EXPERIMENTAL ECOSYSTEMS EXPOSED CONSTANT TIME-VARYING STRESSES-OCEAN DUMPING	NIXON, S. W.	80314303	CONT	76/07/07	$54,913
RHODE ISLAND, UNIV. OF KINGSTON	ROLE OF POLYAMINES IN ADAPTATION OF COLIFORMS TO THE GI TRACT	COHEN, PAUL S.	80325502	INCR	76/08/04	$20,425
RHODE ISLAND, UNIV. OF KINGSTON	NUTRITIONAL REQUIREMENTS OF MARINE LARVAL AND JUVENILE FISH	SIMPSON, K. L.	80381802	CONT	76/07/16	$25,000
RHODE ISLAND, UNIV. OF KINGSTON	EXPERIMENTAL ANALYSIS OF COASTAL MARINE ECOSYSTEMS	KNAUSS, J. A.	80390202	CONT	76/09/29	$985,000
RHODE ISLAND, UNIV. OF KINGSTON	DIFFUSION CHAMBER ARRAY FOR AQUATIC ENVRN. EXPOSURE	SIEBURTH, J. M.	80488601	NEW	76/08/23	$25,000
** DEMONSTRATION **						
RHODE ISLAND PLANNING PROGRAM PROVIDENCE	RHODE ISLAND RESIDUALS RECOVERY IMPLEMENTATION GRANT	DAVID, LOUIS C.	80880901	NEW	76/08/26	$50,000
** TRAINING **						
RHODE ISLAND, UNIVERSITY OF PROVIDENCE	PRESENT & EVALUATE "MIDDLE MGMT HOME STUDY CORR. COURSE.	PROF. HAROLD STERNBACH	00110301	NEW	76/07/12	$3,000
** FELLOWSHIPS **						
RHODE ISLAND, UNIV. OF KINGSTON	ANALYTICAL CHEMISTRY	CUCCO, JOHN ANTHONY	91052001	INCR	76/09/30	$910

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	S O U T H C A R O L I N A					
** RESEARCH **						
BENEDICT COLLEGE COLUMBIA	KINETIC & STABILITY STUDIES OF METAL COMPLEXES IN EFFLUENTS	KINARD, JAMES T.	80349001	INCR	76/08/17	$14,989
CHARLESTON COLLEGE CHARLESTON	ECOLOGICAL ANALYSIS OF AN UNDISTURBED ESTUARINE MARSH ECOSYSTEM IN SOUTH CAROLINA	CHAMBERLAIN, N. A.	80468801	NEW	76/08/04	$70,000
CLEMSON UNIV. CLEMSON	DEVELOPMENT OF ALTERNATIVE CONTROL METHODS TO MIREX AND CHLORDANE FOR IMPORTED FIRE ANT	HAYS, S. B.	80471701	NEW	76/09/08	$39,000
CLEMSON UNIV. CLEMSON	MEMBRANE SEPARATIONS TECH. SEMINAR	JOHNSON, J. K.	80495101	NEW	76/09/30	$8,100
CLEMSON UNIV. CLEMSON	INVESTIGATION OF TREATMENT TECHNOLOGIES FOR DYE MANUFACTURE WASTEWATER	KEINATH, T.	80500201	NEW	76/09/16	$80,000
GREENWOOD COMM. OF PUBLIC WORKS GREENWOOD	PROTECTION OF ASBESTOS CEMENT PIPE FROM CORROSION IN WATER DISTRIBUTION SYSTEMS BY WATER TREATMENT	GRUBB, C. E.	80488801	NEW	76/09/29	$30,600
SOUTH CAROLINA, UNIV. OF COLUMBIA	DEVELOPMENT OF COLLECTION METHODS FOR AIRBORNE PESTICIDES & POLYCHOLINATED BIPHENYLS USING SOLID ADS	JAMES MEEKER	80471601	NEW	76/08/26	$40,038
** DEMONSTRATION **						
TEXIZE CHEMICAL COMPANY GREENVILLE	PERFORMANCE OF ROTATING BIOLOGICAL CONTACTOR ON LIQUID DETERGENT PLANT EFFLUENT	MILESKI, STANLEY E.	80389201	INCR	76/07/16	$26,000
** TRAINING **						
CLEMSON UNIV. CLEMSON	WATER QUALITY INSTRUCTIONAL RESOURCES INFORMATION SYSTEMS	AUSTIN, J. H.	90057601	INCR	76/09/30	$19,994

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	SOUTH CAROLINA					
** TRAINING **						
CLEMSON UNIV. CLEMSON	FOUR-YEAR WATER & WASTEWATER TECHNOLOGY CURRICULUM DEVELOPMENT	CHISMAN, JAMES A.	90066001	INCR	76/09/29	$30,000
GREENVILLE TECH. EDUC. CENTER GREENVILLE	WASTEWATER TECHNOLOGY TRAINING PROGRAM	HYLAND, WILLIAM E.	90010905	INCR	76/07/30	$15,000
SOUTH CAROLINA DEPT. OF HEALTH & ENVRN COLUMBIA	UPGRADE TRAINING FOR WASTEWATER OPERATIONS EMPLOYEES USING A MOBILE TRAINING FACILITY	JENKINS, JOHN E.	00409701	INCR	76/09/30	$2,000
** FELLOWSHIPS **						
CLEMSON UNIV. CLEMSON	M.S.	HARDWICK, N. L.	91092401	NEW	76/09/17	$4.700
CLEMSON UNIV. CLEMSON	M. S. / ENVR. SYSTEMS ENGR.	MILAM, G. K.	91096201	NEW	76/07/30	$6,500
SOUTH CAROLINA, UNIV. OF COLUMBIA	M.S./PUBLIC HEALTH	RICHLAND	91087401	NEW	76/07/09	$4,626
SOUTH CAROLINA, UNIV. OF COLUMBIA	M. ./PUBLIC HEALTH	SEABROOK, H.	91089001	INCR	76/07/30	$160
SOUTH CAROLINA, UNIV. OF COLUMBIA	M.S./PUBLIC HEALTH	FRENCH, R. E.	91096301	NEW	76/09/30	$7,890

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	SOUTH DAKOTA					
** RESEARCH **						
SOUTH DAKOTA DEPT OF ENVIR. PROTECTION PIERRE	GY AREAS IN SOUTH DAKOTA	ROGER STEAD, CHIEF A.	00811402	CONT	76/09/30	$12,920
** DEMONSTRATION **						
EAST DAKOTA CONSERVANCY SUB. DIST. BROOKING	LAKE KAMPESKA BANK SHORELINE PROTECTION	SIEGEL, J. L.	80471301	NEW	76/08/25	$67,000
EAST DAKOTA CONSERVANCY SUB. DIST. BROOKINGS	OAKWOOD LAKES BANK SHORELINE PROTECTION	SIEGEL, J. L.	R0471401	NEW	76/08/10	$26,500
SOUTH DAKOTA DEPT OF ENVIR PROT. PIERRE	SOLID WASTE DEMONSTRATION PROJECT THROUGHOUT STATE	ROGER W. STEAD, CHIEF	00817101	INCR	76/09/08	$15,000
			00817101	NEW	76/08/16	$33,000
** TRAINING **						
SOUTH DAKOTA VO-AG.TEACHERS ASSOC. PIERRE	RULES FOR PRIVATE PESTICIDE APPLICATION	LARRY G. NELSON	00818601	NEW	76/08/04	$3,202

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
TENNESSEE						
** TRAINING **						
VANDERBILT UNIV. NASHVILLE	FORMAL INSTR.& PRACTICAL EXERCISES PERSONAL SAFETY & ON-SCENE COORDINATION HAZARDOUS MATERIALS SPILL	ROTH, J. A.	90063401	NEW	76/09/28	$101,138
** FELLOWSHIPS **						
VANDERBILT UNIV. NASHVILLE	M.S.	FORSTENSON, JOHN C.	91092901	INCR	76/09/29	$500

T E X A S

** RESEARCH **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
BAYLOR COLLEGE OF MEDICINE HOUSTON	NEW&IMPROVED METHODS FOR QUANTITATIVE DETECTION ENTERIC VIRUSES IN POTABLE,RECLAIMED&NATURAL WATERS	MELNICK, JOSEPH L.	80273603	INCR	76/09/17	$31,000
BIO-ECOLOGY SYSTEMS, INC. GRAND PRAIRIE	COMBINED INDUSTRIAL WASTES AS PROCESS REACTANTS FOR MUTUAL DETOXIFICATION	BROWN, W. E.	80468501	NEW	76/09/08	$46,766
SOUTHWEST FDN. FOR RES. & EDUC. SAN ANTONIO	IN VITRO ASSAY OF RELATIVE TOXICITY OF DIESEL-ENGINE EXHAUSTS	MELTZ, MARTIN	80370501	INCR	76/09/30	$30,000
TEXAS A&M RES. FDN. COLLEGE STATION	COLLECTION AND ASSESSMENT OF SUB-MICRON PARTICULATE MATTER	BENSON, FRED J.	80419001	INCR	76/09/17	$30,000
			80419001	INCR	76/09/29	$36,000
TEXAS A&M RES. FDN. COLLEGE STATION	SPECIATION OF ARSENIC IN WATER SUPPLIES	IRGOLIC, K. J.	80477401	NEW	76/09/29	$52,622
TEXAS STATE UNIV. DENTON	OXIDATION OF WATER SUPPLY REFACTORY SPECIES WITH ULTRAVIOLET RADIATION	GLAZE, W. H.	80464001	NEW	76/08/04	$58,377
TEXAS TECH. UNIV. LUBBOCK	CONFERENCE ON MANAGING SALINE WATERS FOR IRRIGATION; PLANNING FOR THE FUTURE .	DREGNE, HAROLD E.	80426501	INCR	76/07/30	$1,600
TEXAS TECH. UNIV. LUBBOCK	ANALYSES OF STATE LAWS & REGULATIONS IMPACTING THE MANAGEMENT OF ANIMAL WASTES	WELLS, D. M.	80487801	NEW	76/09/09	$74,954
TEXAS, UNIV. OF AUSTIN	CHARACTERIZATION OF SHRIMP BACULOVIRUS	SUMMERS, MAX D.	80339502	INCR	76/09/16	$1,215

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
T E X A S						
** RESEARCH **						
TEXAS, UNIV. OF AUSTIN	AEROSOL DYNAMICS	BRUCK, J.R.	80366002	INCR	76/09/09	$9,000
TEXAS, UNIV. OF AUSTIN	REACTION OF SULFUR DIOXIDE IN AEROSOLS	HIMMELBLAU, D. A.	80381402	CONT	76/08/09	$20,000
TEXAS, UNIV. OF SAN ANTONIO	HUMAN ENTERIC VIRUS SURVIVAL IN SOIL FOLLOWING IRRIGATION WITH SEWAGE PLANT EFFLUENTS	SAGIK, B. P.	80384402	CONT	76/07/07	$111,768
TEXAS, UNIV. OF SAN ANTONIO	DEVELOPMENT OF FIELD VIRUS CONCENTRATION TECHNOLOGY	SORBER, C. A.	80447401	NEW	76/09/30	$14,000
TEXAS, UNIV. OF AUSTIN	BIODEGRADATION OF CHLORINATED DIBENZOFURANS AND DIBENZODIOXINS	GIBSON, D. T.	80452501	NEW	76/08/26	$50,000
TEXAS, UNIV. OF GALVESTON	COMBINED TESTING PROTOCOL FOR DETECTING ENVIRONMENTAL MUTAGENIC AGENTS	LEGATOR, MARVIN S.	80462101	NEW	76/07/30	$92,093
TEXAS, UNIV. OF SAN ANTONIO	DESIGN EXPERIMENTS STATISCAL ANALYSES AND EVALUATION OF AQUATIC RESEARCH DATA	DOWNEY, P. G.	80500701	NEW	76/09/28	$33,000
** DEMONSTRATION **						
GULF COAST WASTE DISPOSAL AUTH. HOUSTON	OPTIMIZATION OF OPERATION OF A SYSTEM OF SMALL TREATMENT PLANTS	DANIEL, WILLIAM K.	80485001	NEW	76/08/31	$75,000
** TRAINING **						
TEXAS A&M UNIV. COLLEGE STATION	TRAINING PROGRAM FOR ADVANCE WASTEWATER TREATMENT UNIT PROCESS OPERATIONS	WOLF, HAROLD W.	90044301	INCR	76/09/23	$36,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
U T A H						
** RESEARCH **						
RHO CORP. SALT LAKE CITY	ECONOMIC, DEMOGRAPHIC & LAND USE IMPACT PROJECTION METHODOLOGIES	WEAVER, R.	80502201	NEW	76/09/29	$61,920
UTAH DEPT OF SOCIAL SERVICES SALT LAKE CITY	AIR QUALITY MONITORING ENERGY AREAS	DR LYMAN L. OLSEN, DIR	00813802	CONT	76/09/30	$85,000
UTAH STATE DIVISION OF HEALTH SALT LAKE CITY	LIVESTOCK PASTURING ON NON-POINT SURFACE RUNOFF	WHITE, R. K.	80461701	NEW	76/09/29	$81,391
UTAH STATE UNIV. LOGAN	EVALUATE EXISTING INTERMITTENT SAND FILTERS USED TO UPGRADE EXISTING OR NEW WW STABILIZATION PONDS	MIDDLEBROOKS, E. J.	80459201	NEW	76/09/16	$170,985
UTAH, UNIV. OF SALT LAKE CITY	MASS SPECTROMETRIC ANALYSIS OF INVOLATILE SAMPLES	FUTRELL, JEAN H.	80433501	NEW	76/07/13	$250,319
** DEMONSTRATION **						
UTAH STATE DIVISION OF HEALTH SALT LAKE CITY	SOLID WASTE DEMONSTRATION PROJECT IMPROVEMENT	LYMAN OLSEN, DIRECTOR	00816201	NEW	76/07/26	$28,300
** TRAINING **						
UTAH STATE UNIVERSITY LOGAN	WATER & SOLID WASTE COLLECTION DISPOSAL SYSTEM.	M. K. JEPPERSEN, CONT.	00817901	NEW	76/09/30	$18,954
** FELLOWSHIPS **						
UTAH, UNIV. OF SALT LAKE CITY	B.S./ENVRN. SCIENCE/URBAN PLANNING & AIR POLLUTION CONTROL	JORGENSEN, K. J.	91092201	NEW	76/07/02	$725

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	VERMONT					
** RESEARCH **						
VERMONT YANKEE NUCLEAR POWER CORP. RUTLAND	VERMONT YANKEE HORTICULTURE ECONOMIC AND QUALITY CONTROL STUDY	GAINES, E. P.	80471501	NEW	76/09/09	$20,000
VERMONT, UNIV. OF BURLINGTON	FEASIBLITY STUDY FOR AN ASBESTOS AEROSOL MONITOR	DETENBECK, R. W.	80456201	NEW	76/07/07	$42,894
** TRAINING **						
VERMONT AGCY OF ENVRN CONSERV MONTPELIER	WPC STATE & LOCAL MANPOWER DEVELOPMENT	MARTIN L. JOHNSON	00111801	NEW	76/08/26	$10,100

V I R G I N I A

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
** RESEARCH **						
AMERICAN INST. OF BIOLOGICAL SCIENCES ARLINGTON	SOURCES EFFECTS AND SINK OF PETROLEUM	TRUMBULL, R.	80467501	NEW	76/07/30	$9,500
VIRGINA INST. OF MARINE SCIENCE GLOUCESTER PT.	SUBLETHAL EFFECTS OF CHLORINE ON MARINE VASCULAR PLANTS AND DECAPOD CRUSTACEANS	ROBERTS, M. H.	80387202	CONT	76/07/09	$62,000
VIRGINIA INST. OF MARINE SCIENCE GLOUCESTER POINT	DELINEATION OF COASTAL MARSH BOUNDARIES IN THE CENTRAL ATLANTIC COASTAL REGION	BOON, JOHN D.	80-94701	NEW	76/09/29	$36,000
VIRGINIA INST. OF MARINE SCIENCE GLOUCESTER POINT	ROLE OF SEDIMENTS IN STORAGE, MOVEMENT & BIOLOGICAL UPTAKE OF KEPONE IN ESTUARINE ENVIRONMENTS	HUGGETT, R. J.	80499301	NEW	76/09/29	$177,570
VIRGINIA MEDICAL COLLEGE RICHMOND	EFFECTS OF SELECTED ORGANIC CONTAMINANTS IN DRINKING WATER	BORZELLECA, J. F.	80470101	NEW	76/09/24	$621,033
VIRGINIA MEDICAL COLLEGE RICHMOND	STUDY PATHOGENIC FREE-LIVING AMEBAE IN FRESH WATER LAKES IN VA	DUMA, R. J.	80501401	NEW	76/09/29	$72,556
VIRGINIA POLYTECHNIC INST.&STATE UNIV. BLACKSBURG	PARAMETRIC ASSESSMENT & OPTIMIZATION OF VOLATILE ORGANIC ANALYSIS METHODS	HOEHN, R. C.	80486401	NEW	76/09/14	$76,916
WILLIAM & MARY COLLEGE WILLIAMSBURG	STANDARDS FOR & METHODS OF ANALYSIS OF RAINWATER FOR ACIDITY	TYREE, S. Y.	80499801	NEW	76/09/28	$15,900
** TRAINING **						
VIRGINIA ST WATER CONT BD RICHMOND	TO ASSIST THE STATE OF VIRGINIA IN TRAINING WASTEWATER TREATMENT PLANT OPERATORS	JONES, WESLEY D.	00311002	INCR	76/09/29	$5,500

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	W A S H I N G T O N					
** RESEARCH **						
SEATTLE, MUN. OF METRO. SEATTLE	DISPOSAL OF STABLIZED MUN. INDUSTRIAL SLUDGE IN THE FOREST ENVRN.	MATTHEWS, R. R.	80217203	CONT	76/09/08	$78,000
WASHINGTON STATE DEPT. OF FISHERIES OLYMPIA	MARINE WATER QUALITY COMPENDIUMS FOR WASHINGTON STATE	CARDWELL, RICK D.	80503201	NEW	76/09/30	$23,340
WASHINGTON STATE UNIV. PULLMAN	NATURAL HYDROCARBONS IN PHOTOCHEMICAL AIR POLLUTION	WESTBERG, H. H.	80067005	INCR	76/08/17	$43,509
			80067005	INCR	76/09/23	$40,000
WASHINGTON STATE UNIV. PULLMAN	OPTIMIZATION AND TESTING OF HIGHWAY MATERIALS TO MITIGATE ICE ADHESION	COOK, J. C.	80466001	NEW	76/07/08	$74,774
WASHINGTON, UNIV. OF SEATTLE	CHEMICAL INHIBITION	PAVLOU, SPYROS P.	80036204	INCR	76/08/26	$29,215
WASHINGTON, UNIV. OF SEATTLE	OPTICAL EFFECTS OF ATMOSPHERIC AEROSOL	WAGGONER, A. P.	80066512	CONT	76/07/09	$7[illegible],000
WASHINGTON, UNIV. OF SEATTLE	PLUME OPACITY RELATED TO PARTICLE SIZE AND CHEMICAL COMPOSITION	PILAT, M. J.	80389702	CONT	76/09/15	$33,000
** DEMONSTRATION **						
MOSES LAKE IRRIGATION & REHAB. DIST. MOSES LAKE	MOSES LAKE REHABILITATION PROJECT	CONNELLY, C. J.	80475401	NEW	76/08/31	$124,675
VANCOUVER, PORT OF VANCOUVER	VANCOUVER LAKE REHABILITATION	NETH, O.	80472901	NEW	76/08/23	$25,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	WASHINGTON					
** TRAINING **						
WASHINGTON, UNIV. OF SEATTLE	PROFESSIONAL TRAINING IN WATER SUPPLY & POLLUTION CONTROL	SYLVESTER, ROBERT O.	90031305	INCR	76/08/10	$25,900

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
		WEST VIRGINIA				
** DEMONSTRATION **						
HOUDAILLE INDUSTRIES, INC. HUNTINGTON	NICKEL RECOVERY FROM WASTE TREATMENT & PURIFICATION SLUDGES	HUGGETT, ROBERT E.	80443401	NEW	76/08/26	$85,000
			80443401	INCR	76/09/28	$23,710
SOUTH CHARLESTON, CITY OF SOUTH CHARLESTON	CO-DISPOSAL OF SEWAGE SLUDGE & MUNICIPAL REFUSE	CAVENDISH, LYNN	80376901	INCR	76/09/27	$182,000
** TRAINING **						
WEST VIRGINIA, UNIV. OF MORGANTOWN	AIR POLLUTION CONTROL TRAINING PROGRAM	LINSKY, BENJAMIN	90056702	CONT	76/09/08	$55,600

W I S C O N S I N

** RESEARCH **

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
INSTITUTE OF PAPER CHEMISTRY APPLETON	COMBINED MEMBRANE & FREEZING CONCENTRATION OF BLEACHING RECYCLE WATERS	WILEY, AVERILL J.	80352501	INCR	76/08/06	$40,000
MILWAUKEE CNTY. METRO. SEWER DIST. MILWAUKEE	VERIFICATION OF WATER QUALITY IMPACT RESULTING FROM COMBINED SEWER OVERFLOW USING REAL-TIME DATA	WEILAND, D. G.	80451801	NEW	76/07/21	$132,152
OASIS 2000, INC. RICE LAKE	ENERGY AND ECONOMIC ASSESSMENT OF ANAEROBIC DIGESTER AND BIOFUELS FOR RURAL WASTE MANAGEMENT	BROWNLEE, R.M.	80445701	NEW	76/08/10	$107,539
WISCONSIN DEPT. OF NATURAL RESOURCES MADISON	EVALUATION OF LAKE REHABILITATION PROJECT AT MIRROR AND SHADOW LAKES	WINTER, D. R.	80468701	NEW	76/08/26	$116,437
WISCONSIN DNR MADISON	MENOMONEE RIVER WATERSHED STUDY OF MAJOR & TRACE CONSTITUENTS	JOHN KONRAD SUPV.	00514201	INCR	76/08/04	$135,000
WISCONSIN, UNIV. OF STEVENS POINT	NON-POINT POLLUTION IN RELATION TO EUTROPHICATION & OXYGEN DEPLETION IN 7000 ACRE RESERVOIR	SHAW, B. H.	40354702	CONT	76/08/06	$65,622
WISCONSIN, UNIV. OF MADISON	IMPACT OF COAL-FIRED POWER PLANTS ON THE ENVIRONMENT	CLAPP, J. L.	80397102	CONT	76/07/23	$708,405
WISCONSIN, UNIV. OF MADISON	HEAVY METAL BIOAVAILABILITY IN SLUDGE AMENDED SOILS	COREY, R. B.	80461401	NEW	76/08/06	$136,233
WISCONSIN, UNIV. OF MADISON	DEVELOPMENT OF A STANDARD LEACHING TEST	HAM, R. K.	80477301	NEW	76/09/15	$126,640
WISCONSIN, UNIV. OF MADISON	EVALUATION OF IMPLEMENTATION OF WHITE CLAY LAKE PROTECTION & MANAGEMENT PLAN	PETERSON, JAMES O.	80482301	NEW	76/09/24	$123,919

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
W I S C O N S I N						
** RESEARCH **						
WISCONSIN, UNIV. OF MADISON	INPUT DEPOSITION AND POST DESPOSITIONAL CONVERSION OF ARSENIC IN ACQUATIC ENVRN.	ANDERSON, MARC	80488101	NEW	76/09/14	$115,000
WISCONSIN, UNIV. OF SUPERIOR	DEVELOPMENT OF BIOASSAY PROCEDURES FOR DEFINING POLLUTION OF HARBOR SEDIMENTS	BAHNICK, DONALD A.	80491801	NEW	76/09/16	$198,091
WISCONSIN, UNIV. OF MADISON	ECOLOGICAL-BIOLOGICAL EFFECTS AND INTERACTIONS OF PESTICIDES IN A SOIL-PLANT-WATER MICROCOSM	LICHTENSTEIN, E. PAUL	80492001	NEW	76/09/30	$80,995
** DEMONSTRATION **						
WISCONSIN DEPT. OF NATURAL RESOURCES MADISON	LITTLE MUSKEGO PROTECTION & REHABILITATION PROJECT	VOIGT, L. P.	80423601	NEW	76/08/10	$995,000
WISCONSIN DEPT. OF NATURAL RESOURCES MADISON	LAKE NOQUEBAY PROTECTION AND REHABILITATION PROJECT	EARL, A. S.	80476801	NEW	76/08/23	$205,000
** TRAINING **						
WISCONSIN DNR MADISON	SOLID WASTE MANAGEMENT TRAINING GRANT	A S EARL SECY	00530201	NEW	76/07/27	$21,080
** FELLOWSHIPS **						
WISCONSIN, UNIV. OF MADISON	PH.D./AIR POLLUTION CONTROL	SAMSON, P. J.	91058601	INCR	76/07/30	$1,428
WISCONSIN, UNIV. OF MADISON	M.S./ENVRN. ENGR.	WILKENING, KENNETH E.	91062801	INCR	76/07/30	$1,014
WISCONSIN, UNIV. OF MADISON	M.S./WATER RESOURCES MGMT.	NYLANDER, CHARLES L.	91097201	NEW	76/08/23	$6,500

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
W Y O M I N G						
** RESEARCH **						
WYOMING DEPT OF ENVIR QUALITY CHEYENNE	GY 'REAS OF WYOMING	ROBERT SUNDIN, DIRECTO	00812302	CONT	76/09/30	$45,000
WYOMING, UNIV. OF LARAMIE	METHODS DEVELOPMENT FOR ASSESSING TRADEOFFS IN ENVRN. MGMT.	CROCKER, T.	80505901	NEW	76/09/30	$611,000
** TRAINING **						
WYOMING ASSOCIATION OF MUNICIPALITIES CHEYENNE	1976 SOLID WASTE WORKSHOPS	WALTER W. KINGHAM, DIR	00818801	NEW	76/09/30	$5,000
WYOMING DEPT. OF ENVIR. QUALITY CHEYENNE	WYOMING WPC STATE OPERATOR TRAINING	ROBERT E. SUNDIN, DIRE	00817501	INCR	76/08/27	$9,915

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	PUERTO RICO					
** DEMONSTRATION **						
PFIZER PHARMACEUTICALS INC BARCELONETA	DEMONSTRATION OF EVAPORATOR-INCINERATOR FOR CONCENTRATED PHARMACEUTICAL WASTES	ROWLAND, J. ROBERT	80328601	INCR	76/08/06	$49,000
** TRAINING **						
PRASA SAN JUAN	MANPOWER DEVELOPMENT & TRAINING	PEDRO HERNANDEZ VEGA	00215001	NEW	76/09/30	$10,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	VIRGIN ISLANDS					
** TRAINING **						
VI GOV'T OF CONS & CULTURAL AFFAIRS CHARLOTTE AMALIE	WATER POLLUTION-OPERATOR TRAINING	PEDRITO FRANCOIS, DIR	00214501	NEW	76/09/23	$10,000

APPLICANT MUNICIPALITY	TITLE	PROJECT DIRECTOR / FELLOW	GRANT NO	TYPE OF GRANT	DATE OF AWARD	AMOUNT OF GRANT AWARD
	FOREIGN COUNTRIES FRANCE					
** RESEARCH **						
CENTRE NUCLEAIRES DE FONTENSAY AUX ROS PARIS	SIMULTANEOUS COMPARISON OF THE EAA & THE DIFFUSION BATTERY FOR THE ATMOSPHERIC AEROSOL	BRICARD, JEAN	80437001	NEW	76/07/02	$21,925

SECTION II

GRANT NUMBER	STATE	PROGRAM	APPLICANT
800250-010	DC	DEMONSTRATION	NATIONAL CANNER'S RES. FDN.
800362-044	WA	RESEARCH	WASHINGTON, UNIV. OF
800397-043	PA	RESEARCH	PENNSYLVANIA STATE UNIV.
800426-060	CO	RESEARCH	COLORADO STATE UNIV.
800665-120	WA	RESEARCH	WASHINGTON, UNIV. OF
800670-051	WA	RESEARCH	WASHINGTON STATE UNIV.
800670-052	WA	RESEARCH	WASHINGTON STATE UNIV.
800881-056	CA	RESEARCH	LAC/USC MEDICAL CENTER
800916-043	NC	RESEARCH	NORTH CAROLINA, UNIV. OF
801245-060	IN	RESEARCH	NOTRE DAME, UNIV. OF
802030-210	MA	RESEARCH	HARVARD UNIV.
802087-030	IL	RESEARCH	CHICAGO MED. SCHOOL
802160-002	CA	RESEARCH	CALIFORNIA INST. OF TECH.
802172-030	WA	RESEARCH	SEATTLE, MUN. OF METRO.
802233-032	NC	RESEARCH	NORTH CAROLINA, UNIV. OF
802286-032	OR	RESEARCH	OREGON STATE UNIV.
802309-019	MN	DEMONSTRATION	ELY, CITY OF
802472-030	NC	RESEARCH	NORTH CAROLINA, UNIV. OF
802570-030	MD	RESEARCH	NATIONAL COUNCIL ON RADIATION
802596-030	MI	RESEARCH	MICHIGAN TECH. UNIV.
802601-010	RI	RESEARCH	RHODE ISLAND, UNIV. OF
802670-010	CA	RESEARCH	CALIFORNIA, UNIV. OF
802736-032	TX	RESEARCH	BAYLOR COLLEGE OF MEDICINE
802759-031	NC	RESEARCH	NORTH CAROLINA STATE UNIV.
802827-014	CT	RESEARCH	CONNECTICUT, UNIV. OF
802890-021	DE	RESEARCH	DELAWARE STATE COLLEGE
803069-015	MA	RESEARCH	MASSACHUSETTS, UNIV. OF
803078-032	IL	RESEARCH	IIT RESEARCH INST.
803079-030	MT	RESEARCH	MONTANA STATE UNIV.
803090-030	OR	RESEARCH	OREGON STATE UNIV.
803113-030	NY	RESEARCH	COLUMBIA UNIV.
803143-030	RI	RESEARCH	RHODE ISLAND, UNIV. OF
803154-022	LA	RESEARCH	GRAMBLING STATE UNIV.
803188-010	CA	RESEARCH	STANFORD UNIV.
803215-030	MT	RESEARCH	MONTANA, UNIV. OF
803218-016	OK	RESEARCH	OKLAHOMA STATE DEPT. OF HEALTH
803242-030	MA	RESEARCH	MASSACHUSETTS INST. OF TECH.
803255-021	RI	RESEARCH	RHODE ISLAND, UNIV. OF
803286-014	PR	DEMONSTRATION	PFIZER PHARMACEUTICALS INC
803291-030	MI	RESEARCH	MICHIGAN, UNIV. OF
803299-030	NC	RESEARCH	NORTH CAROLINA CENTRAL UNIV.
803322-030	MT	RESEARCH	MONTANA STATE UNIV.
803336-015	CA	DEMONSTRATION	NORTH MARIN CNTY. WATER DIST.
803343-013	CA	DEMONSTRATION	SACRAMENTO REGIONAL CNTY. SAN. DIST.
803346-030	IL	RESEARCH	ILLINOIS, UNIV. OF
803370-030	NY	RESEARCH	FORDHAM UNIV.
803389-030	AZ	RESEARCH	ARIZONA, UNIV. OF
803395-022	TX	RESEARCH	TEXAS, UNIV. OF
803399-021	MI	RESEARCH	MICHIGAN, UNIV. OF
803407-013	MI	RESEARCH	MICHIGAN, UNIV. OF
803452-011	NY	RESEARCH	RENSSELAER POLYTECHNIC INST.
803459-012	CA	DEMONSTRATION	CALIFORNIA STATE WATER RESOURCES BD.

GRANT NUMBER	STATE	PROGRAM	APPLICANT
803490-012	SC	RESEARCH	BENEDICT COLLEGE
803509-020	NJ	RESEARCH	NEW JERSEY INST. OF TECHNOLOGY
803520-022	NY	RESEARCH	NEW YORK STATE DEPT. OF ENVRN. CONSERV
803525-014	WI	RESEARCH	INSTITUTE OF PAPER CHEMISTRY
803540-011	OH	RESEARCH	DAYTON, UNIV. OF
803547-020	WI	RESEARCH	WISCONSIN, UNIV. OF
803602-020	MN	DEMONSTRATION	ST. PAUL METRO. WASTE CONTROL COMM.
803607-021	FL	RESEARCH	FLORIDA, UNIV. OF
803611-011	MI	RESEARCH	MICHIGAN ENVRN. RES. INST.
803634-010	NY	RESEARCH	CORNELL UNIV.
803656-012	PA	DEMONSTRATION	MATLACK, INC.
803660-022	TX	RESEARCH	TEXAS, UNIV. OF
803684-020	CO	RESEARCH	COLORADO STATE UNIV.
803692-020	FL	RESEARCH	FLORIDA, UNIV. OF
803705-013	TX	RESEARCH	SOUTHWEST FDN. FOR RES. & EDUC.
803719-012	CA	RESEARCH	CALIFORNIA, DEPT. OF HEALTH
803726-011	CA	RESEARCH	HYDROCOMP, INC.
803738-020	MA	RESEARCH	MASSACHUSETTS INST. OF TECH.
803742-012	CT	RESEARCH	RISDON MANUFACTURING CO.
803755-020	OH	RESEARCH	OHIO STATE UNIV. RES. FDN.
803764-011	NC	RESEARCH	ST. AUGUSTINES COLLEGE
803764-020	NC	RESEARCH	SAINT AUGUSTINE'S COLLEGE
803769-012	WV	DEMONSTRATION	SOUTH CHARLESTON, CITY OF
803773-020	CA	RESEARCH	CALIFORNIA, UNIV. OF
803774-020	NY	RESEARCH	SYRACUSE UNIV.
803786-010	FL	RESEARCH	FLORIDA A&M UNIV.
803788-020	CO	RESEARCH	COLORADO STATE UNIV.
803797-011	KS	RESEARCH	KANSAS STATE UNIV.
803799-020	CA	RESEARCH	CALIFORNIA, UNIV. OF
803802-020	CA	RESEARCH	STANFORD RES. INST.
803805-021	IL	RESEARCH	IIT RESEARCH INST.
803805-020	IL	RESEARCH	IIT RESEARCH INST.
803814-020	TX	RESEARCH	TEXAS, UNIV. OF
803818-020	RI	RESEARCH	RHODE ISLAND, UNIV. OF
803820-011	MS	RESEARCH	MISSISSIPPI, UNIV. OF
803826-020	FL	RESEARCH	MIAMI, UNIV. OF
803827-020	NJ	RESEARCH	PRINCETON UNIV.
803831-012	CO	RESEARCH	UPPER THOMPSON SAN. DIST.
803835-020	AL	RESEARCH	AUBURN UNIV.
803838-020	NC	RESEARCH	DUKE UNIV. MARINE LAB.
803839-020	MD	RESEARCH	MARYLAND, UNIV. OF
803844-020	TX	RESEARCH	TEXAS, UNIV. OF
803849-010	FL	RESEARCH	FLORIDA, UNIV. OF
803851-021	MN	RESEARCH	MINNESOTA, UNIV. OF
803859-021	MI	RESEARCH	MICHIGAN STATE UNIV.
803868-020	OH	RESEARCH	OHIO STATE UNIV. RES. FDN.
803870-020	MN	RESEARCH	MINNESOTA, UNIV. OF
803872-020	VA	RESEARCH	VIRGINA INST. OF MARINE SCIENCE
803887-012	FL	RESEARCH	FLORIDA STATE UNIV.
803892-013	SC	DEMONSTRATION	TEXIZE CHEMICAL COMPANY
803893-020	FL	RESEARCH	MIAMI, UNIV. OF
803896-014	MO	RESEARCH	WASHINGTON UNIV.

GRANT NUMBER	STATE	PROGRAM	APPLICANT
R03896-016	MO	RESEARCH	WASHINGTON UNIV.
R03896-015	MO	RESEARCH	WASHINGTON UNIV.
R03897-020	WA	RESEARCH	WASHINGTON, UNIV. OF
R03902-020	RI	RESEARCH	RHODE ISLAND, UNIV. OF
R03903-011	IA	RESEARCH	AMES, CITY OF
R03915-011	IL	RESEARCH	DEPAUL UNIV.
R03918-020	IL	• RESEARCH	ILLINOIS, UNIV. OF
R03922-020	AK	RESEARCH	ALASKA, UNIV. OF
R03932-020	MN	RESEARCH	MINNESOTA, UNIV. OF
R03945-020	AK	RESEARCH	ALASKA, UNIV. OF
R03950-020	CO	RESEARCH	COLORADO STATE UNIV.
R03952-020	MN	RESEARCH	MINNESOTA, UNIV. OF
R03965-020	IN	RESEARCH	PURDUE UNIV.
R03971-020	WI	RESEARCH	WISCONSIN, UNIV. OF
R03977-020	NY	RESEARCH	SYRACUSE RES. CORP.
R03983-011	HI	RESEARCH	HAWAII, UNIV. OF
R04102-021	IA	RESEARCH	IOWA STATE UNIV.
R04102-020	IA	RESEARCH	IOWA STATE UNIV.
R04123-020	MA	RESEARCH	MASSACHUSETTS INST. OF TECH.
R04152-020	AK	RESEARCH	ALASKA, UNIV. OF
R04168-011	OH	RESEARCH	CHILDREN'S HOSPITAL
R04190-011	TX	RESEARCH	TEXAS A&M RES. FDN.
R04190-012	TX	RESEARCH	TEXAS A&M RES. FDN.
R04204-011	GA	RESEARCH	ATLANTA UNIV. CTR.
R04205-010	CA	RESEARCH	CALIFORNIA, UNIV. OF
R04215-011	CA	RESEARCH	CALIFORNIA, UNIV. OF
R04236-010	WI	DEMONSTRATION	WISCONSIN DEPT. OF NATURAL RESOURCES
R04256-010	OH	RESEARCH	AKRON, UNIV. OF
R04265-011	TX	RESEARCH	TEXAS TECH. UNIV.
R04270-010	MO	RESEARCH	MISSOURI, UNIV. OF
R04286-012	PA	RESEARCH	PITTSBURGH, UNIV. OF
R04288-010	DE	RESEARCH	NATIONAL COMMITTEE FOR IAWPR
R04323-010	OK	RESEARCH	LANGSTON UNIV.
R04329-012	NC	RESEARCH	AMERICAN TEXTILE MANUFACTURING INST.
R04331-010	NY	RESEARCH	GRUMMAN AEROSPACE CORP.
R04335-010	UT	RESEARCH	UTAH, UNIV. OF
R04338-010	NJ	RESEARCH	MONTCLAIR STATE COLLEGE
R04367-012	DC	DEMONSTRATION	INSTITUTE OF INDUSTRIAL LAUNDERERS
R04370-010	FC	RESEARCH	CENTRE NUCLEAIRES DE FONTENSAY AUX ROS
R04375-011	FL	RESEARCH	FLORIDA STATE OFFICE OF HEALTH
R04401-011	DC	RESEARCH	AMERICAN DEFENSE PREPAREDNESS ASSOC.
R04404-012	LA	RESEARCH	NEW ORLEANS SEWERAGE & WATER BD.
R04413-010	NC	RESEARCH	NORTH CAROLINA, UNIV. OF
R04421-010	OH	RESEARCH	DAYTON, UNIV. OF
R04424-011	MI	RESEARCH	MICHIGAN STATE UNIV.
R04428-011	NY	RESEARCH	SYRACUSE UNIV.
R04434-011	WV	DEMONSTRATION	HOUDAILLE INDUSTRIES, INC.
R04434-010	WV	DEMONSTRATION	HOUDAILLE INDUSTRIES, INC.
R04443-010	IN	RESEARCH	PURDUE RES. FDN.
R04450-012	CA	RESEARCH	TETRA TECH. INC.
R04457-010	WI	RESEARCH	OASIS 2000, INC.
R04458-011	FL	RESEARCH	WEST FLORIDA, UNIV. OF

91

GRANT NUMBER	STATE	PROGRAM	APPLICANT
804460-011	OH	RESEARCH	MAHONING CNTY. BD. OF COMM.
804462-010	PA	RESEARCH	FRANKLIN INST.
804469-010	DC	RESEARCH	ENVIRONMENTAL LAW INST.
804472-011	CO	RESEARCH	COLORADO, UNIV. OF
804474-010	TX	RESEARCH	TEXAS, UNIV. OF
804499-010	GA	RESEARCH	FORT VALLEY STATE COLLEGE
804503-011	MI	RESEARCH	MICHIGAN, UNIV. OF
804504-010	NH	DEMONSTRATION	A. C. LAWRENCE LEATHER CO.
804509-010	NY	RESEARCH	CORNELL UNIV.
804511-010	PA	DEMONSTRATION	PENNSYLVANIA DEPT. OF ENVRN. RESOURCES
804516-010	CA	RESEARCH	CALIFORNIA, UNIV. OF
804518-010	WI	RESEARCH	MILWAUKEE CNTY. METRO. SEWER DIST.
804525-010	TX	RESEARCH	TEXAS, UNIV. OF
804528-010	DC	RESEARCH	RESOURCES FOR THE FUTURE, INC.
804530-010	FL	RESEARCH	FLORIDA, UNIV. OF
804533-010	IA	RESEARCH	IOWA STATE UNIV.
804536-012	DC	RESEARCH	SMITHSONIAN INST.
804536-011	DC	RESEARCH	SMITHSONIAN INST.
804541-011	FL	RESEARCH	WEST FLORIDA, UNIV. OF
804542-010	DC	RESEARCH	AMERICAN STATISTICAL ASSOCIATION
804545-010	CA	RESEARCH	SOUTHERN CALIFORNIA MEDICAL CTR.
804547-010	IN	RESEARCH	PURDUE RES. FDN.
804562-010	VT	RESEARCH	VERMONT, UNIV. OF
804569-010	IL	RESEARCH	ILLINOIS, UNIV. OF
804570-010	FL	RESEARCH	FLORIDA, UNIV. OF
804571-010	LA	RESEARCH	JEFFERSON PARISH
804571-011	LA	RESEARCH	JEFFERSON PARISH
804572-010	NY	RESEARCH	UNION COLLEGE
804573-012	NY	RESEARCH	NEW YORK STATE UNIV. RES. FDN.
804577-010	NC	RESEARCH	NORTH CAROLINA, UNIV. OF
804579-010	NY	RESEARCH	NEW YORK STATE DEPT. ENVRN. CONSERV.
804584-010	NY	RESEARCH	SYRACUSE RESEARCH CORP.
804585-010	NE	RESEARCH	CREIGHTON UNIV.
804587-010	ME	RESEARCH	MAINE, UNIV. OF
804589-010	NC	RESEARCH	DUKE UNIV.
804592-010	UT	RESEARCH	UTAH STATE UNIV.
804594-010	PA	RESEARCH	PENNSYLVANIA, UNIV. OF
804595-012	MT	RESEARCH	MONTANA COLLEGE OF MINERAL SCI.
804596-010	MD	RESEARCH	JOHN HOPKINS UNIV.
804597-010	DC	RESEARCH	AMERICAN FROZEN FOOD INST.
804600-010	MN	RESEARCH	MINNESOTA, UNIV. OF
804606-010	CA	RESEARCH	LOMA LINDA UNIV.
804607-010	MI	RESEARCH	MICHIGAN, UNIV. OF
804609-010	NY	RESEARCH	SYRACUSE RES. FDN.
804610-010	CA	RESEARCH	PACIFIC, UNIV. OF
804611-010	FL	RESEARCH	MIAMI, UNIV. OF
804612-011	OH	RESEARCH	OHIO STATE UNIV.
804613-010	OK	RESEARCH	OKLAHOMA AGRIC. EXPERIMENT STA
804614-010	WI	RESEARCH	WISCONSIN, UNIV. OF
804615-010	OH	RESEARCH	OHIO RIVER VALLEY WATER SAN. COMM.
804617-010	UT	RESEARCH	UTAH STATE DIVISION OF HEALTH
804620-010	CA	RESEARCH	CHINO BASIN MUN. WATER DIST.

92

GRANT NUMBER	STATE	PROGRAM	APPLICANT
804621-010	TX	RESEARCH	TEXAS, UNIV. OF
804622-010	OR	RESEARCH	OREGON STATE UNIV.
804623-010	FL	RESEARCH	MIAMI, UNIV. OF
804631-010	OH	RESEARCH	OHIO AGRI. RES. & DEVELOPMENT CTR.
804632-010	OH	RESEARCH	OHIO MENTAL HEALTH
804633-010	FL	RESEARCH	FLORIDA, UNIV. OF
804634-010	FL	RESEARCH	FLORIDA, UNIV. OF
804635-010	NC	RESEARCH	NORTH CAROLINA, UNIV. OF
804636-010	NY	RESEARCH	CORNELL UNIV.
804637-010	NY	RESEARCH	NEW YORK, UNIV. OF
804639-010	DC	RESEARCH	AMERICAN PETROLEUM INST.
804640-010	TX	RESEARCH	TEXAS STATE UNIV.
804643-010	MO	RESEARCH	MIDWEST RESEARCH INST.
804647-010	LA	RESEARCH	NEW ORLEANS, UNIV. OF
804650-010	NC	RESEARCH	NORTH CAROLINA, UNIV. OF
804652-010	MI	RESEARCH	MICHIGAN, UNIV. OF
804653-010	NC	RESEARCH	NORTH CAROLINA STATE UNIV.
804654-010	NY	RESEARCH	NASSAU CNTY.
804655-010	CT	RESEARCH	SEABOARD METAL FINISHING CO., INC.
804656-010	DE	RESEARCH	DELAWARE, UNIV. OF
804657-010	CA	RESEARCH	CENTRAL CONTRA COSTA SAN. DIST.
804658-010	NY	RESEARCH	NEW YORK, UNIV. OF
804658-011	NY	RESEARCH	NEW YORK, UNIV. OF
804659-010	NY	RESEARCH	CLARKSON COLLEGE OF TECHNOLOGY
804660-010	WA	RESEARCH	WASHINGTON STATE UNIV.
804661-010	CO	RESEARCH	COLORADO SCHOOL OF MINES
804671-010	CO	RESEARCH	COLORADO STATE UNIV.
804672-010	CO	RESEARCH	COLORADO STATE UNIV.
804673-010	CO	RESEARCH	COLORADO STATE UNIV.
804675-010	VA	RESEARCH	AMERICAN INST. OF BIOLOGICAL SCIENCES
804677-010	IN	RESEARCH	NOTRE DAME, UNIV. OF
804679-010	AZ	RESEARCH	ARIZONA, UNIV. OF
804681-010	CA	RESEARCH	CALIFORNIA, UNIV. OF
804682-010	NJ	RESEARCH	AMERICAN ELECTROPLATERS SOCIETY, INC.
804683-010	PA	RESEARCH	ACADEMY OF NATURAL SCIENCES
804684-010	IL	RESEARCH	ILLINOIS, UNIV. OF
804685-010	TX	RESEARCH	BIO-ECOLOGY SYSTEMS, INC.
804686-010	MI	RESEARCH	MICHIGAN, UNIV. OF
804687-010	WI	RESEARCH	WISCONSIN DEPT. OF NATURAL RESOURCES
804688-010	SC	RESEARCH	CHARLESTON COLLEGE
804689-010	NY	RESEARCH	NEW YORK STATE DEPT. OF HEALTH
804691-010	MN	DEMONSTRATION	WASECA, CITY OF
804692-010	CA	RESEARCH	CALIFORNIA STATE DEPT. OF HEALTH
804693-010	CT	DEMONSTRATION	HAFNER INDUSTRIES, INC.
804695-010	IN	DEMONSTRATION	NOBLE CNTY. SOIL & WATER CONSERV. DIST
804696-010	MA	DEMONSTRATION	WELLESLEY, TOWN OF
804697-010	OR	RESEARCH	OREGON STATE UNIV.
804700-010	MA	RESEARCH	HARVARD UNIV.
804701-010	VA	RESEARCH	VIRGINIA MEDICAL COLLEGE
804703-010	OH	RESEARCH	FARM BUREAU DEVELOPMENT CORP.
804707-010	MN	DEMONSTRATION	HENNEPIN CNTY. PARK RESERVE DIST.
804709-010	CA	RESEARCH	SOUTHERN CALIFORNIA METRO WATER DIST.

93

[illegible]

GRANT NUMBER	STATE	PROGRAM	APPLICANT
804710-010	NJ	RESEARCH	NEW JERSEY INST. OF TECH. FDN.
804713-010	SD	DEMONSTRATION	EAST DAKOTA CONSERVANCY SUB. DIST.
804714-010	SD	DEMONSTRATION	EAST DAKOTA CONSERVANCY SUB. DIST.
804715-010	VT	RESEARCH	VERMONT YANKEE NUCLEAR POWER CORP.
804716-010	SC	RESEARCH	SOUTH CAROLINA, UNIV. OF
804717-010	SC	RESEARCH	CLEMSON UNIV.
804718-010	DC	RESEARCH	AMERICAN SOCIETY FOR MICROBIOLOGY
804719-010	CO	RESEARCH	COLORADO STATE UNIV.
804723-010	OH	RESEARCH	CENTRAL STATE UNIV.
804724-010	MA	RESEARCH	SALEM & BEVERLY WATER SUPPLY BD
804727-010	MA	DEMONSTRATION	MASSACHUSETTS DEPT ENVRN QUALITY ENGR
804729-010	WA	DEMONSTRATION	VANCOUVER, PORT OF
804731-010	IL	RESEARCH	ATLANTIC RICHFIELD CO.
804732-010	IL	DEMONSTRATION	AMERICAN SOCIETY OF PLANNING OFFICIALS
804734-010	NY	RESEARCH	SYRACUSE UNIV.
804736-010	MN	RESEARCH	MINNESOTA, UNIV. OF
804743-010	NY	RESEARCH	NEW YORK DEPT. OF HEALTH
804748-010	AL	RESEARCH	ALABAMA, UNIV. OF
804749-010	FL	RESEARCH	MIAMI, UNIV. OF
804750-010	OR	RESEARCH	OREGON GRADUATE CTR. FOR STUDY & RES.
804751-010	AZ	RESEARCH	ARIZONA, UNIV. OF
804754-010	WA	DEMONSTRATION	MOSES LAKE IRRIGATION & REHAB. DIST.
804760-010	CA	RESEARCH	CALIFORNIA, UNIV. OF
804761-010	DC	RESEARCH	NATIONAL DEMONSTRATION WATER PROJECT
804762-010	AL	RESEARCH	SOUTHERN RES. INST.
804763-010	PA	RESEARCH	DREXEL UNIV.
804764-010	OR	RESEARCH	PORTLAND STATE UNIV.
804768-010	WI	DEMONSTRATION	WISCONSIN DEPT. OF NATURAL RESOURCES
804770-010	NC	RESEARCH	NORTH CAROLINA, UNIV. OF
804773-010	WI	RESEARCH	WISCONSIN, UNIV. OF
804774-010	TX	RESEARCH	TEXAS A&M RES. FDN.
804776-010	NY	RESEARCH	ASSOCIATED UNIVERSITIES, INC.
804778-010	NC	RESEARCH	NORTH CAROLINA, UNIV. OF
804779-010	NY	RESEARCH	NEW YORK STATE UNIV.
804780-010	FL	RESEARCH	MIAMI, UNIV. OF
804781-010	OH	RESEARCH	NATIONAL WATER WELL ASSOC.
804782-010	NY	RESEARCH	SYRACUSE RESEARCH CORP.
804789-010	CA	DEMONSTRATION	SAN LUIS OBISPO CNTY.
804791-010	IL	DEMONSTRATION	SPRINGFIELD, CITY OF
804794-010	MO	RESEARCH	WASHINGTON UNIV.
804799-010	ID	DEMONSTRATION	NEZ PERCE CNTY.
804801-010	MN	DEMONSTRATION	DULUTH, CITY OF
804804-010	ME	RESEARCH	MAINE MUN. ASSOC.
804809-010	RI	DEMONSTRATION	RHODE ISLAND PLANNING PROGRAM
804810-010	NJ	DEMONSTRATION	MIDDLESEX CNTY.
804811-010	NC	RESEARCH	NORTH CAROLINA STATE UNIV.
804812-010	MA	DEMONSTRATION	BOSTON METRO. DIST. COMM.
804815-010	FL	DEMONSTRATION	FLORIDA DEPT. OF ENVRN. REGULATION
804816-010	KY	RESEARCH	LOUISVILLE, UNIV. OF
804817-010	KY	RESEARCH	KENTUCKY, UNIV. OF
804820-010	NY	RESEARCH	RENSSELAER POLYTECHNIC INST.
804821-010	IL	RESEARCH	ILLINOIS, UNIV. OF

GRANT NUMBER	STATE	PROGRAM	APPLICANT
804822-010	OK	RESEARCH	OKLAHOMA, UNIV. OF
804823-010	WI	RESEARCH	WISCONSIN, UNIV. OF
804827-010	CO	RESEARCH	COLORADO STATE UNIV.
804828-010	CO	RESEARCH	COLORADO STATE UNIV.
804829-010	CO	RESEARCH	DENVER, UNIV. OF
804830-010	GA	RESEARCH	GEORGIA INST. OF TECH.
804832-010	MA	RESEARCH	HARVARD UNIV.
804833-010	AK	RESEARCH	ALASKA, UNIV. OF
804835-010	NY	DEMONSTRATION	NEW YORK STATE DEPT. OF ENVRN. CONSERV
804846-010	PA	DEMONSTRATION	PENNSYLVANIA DEPT. OF ENVRN. RESOURCES
804847-010	OK	RESEARCH	OKLAHOMA STATE UNIV.
804848-010	IL	RESEARCH	ILLINOIS, UNIV. OF
804848-011	IL	RESEARCH	ILLINOIS, UNIV. OF
804849-010	IN	RESEARCH	INDIANA UNIV. FDN.
804849-011	IN	RESEARCH	INDIANA UNIV. FDN.
804850-010	TX	DEMONSTRATION	GULF COAST WASTE DISPOSAL AUTH.
804851-010	OH	RESEARCH	OHIO STATE UNIV.
804854-010	NJ	RESEARCH	EDGEWATER, BOROUGH OF
804859-010	MO	RESEARCH	MISSOURI, UNIV. OF
804860-010	NC	RESEARCH	DUKE UNIV.
804864-010	VA	RESEARCH	VIRGINIA POLYTECHNIC INST.&STATE UNIV.
804865-010	NJ	RESEARCH	RUTGERS UNIV.
804866-010	MD	RESEARCH	MARYLAND, UNIV. OF
804868-010	GA	RESEARCH	GEORGIA, UNIV. OF
804869-010	MD	RESEARCH	JOHNS HOPKINS UNIV.
804878-010	TX	RESEARCH	TEXAS TECH. UNIV.
804880-010	NJ	RESEARCH	NORTHWEST BERGEN CNTY. SEWER AUTH.
804881-010	WI	RESEARCH	WISCONSIN, UNIV. OF
804882-010	NH	RESEARCH	NEW HAMPSHIRE, UNIV. OF
804886-010	RI	RESEARCH	RHODE ISLAND, UNIV. OF
804888-010	SC	RESEARCH	GREENWOOD COMM. OF PUBLIC WORKS
804898-010	OR	RESEARCH	OREGON, UNIV. OF
804900-010	NY	RESEARCH	CORNELL UNIV.
804901-010	NY	DEMONSTRATION	GENERAL ELECTRIC CO.
804902-010	IN	RESEARCH	EVANSVILLE, CITY OF
804903-010	MO	RESEARCH	MISSOURI, UNIV. OF
804909-010	CT	RESEARCH	YALE UNIV.
804917-010	NC	RESEARCH	NORTH CAROLINA, UNIV. OF
804918-010	WI	RESEARCH	WISCONSIN, UNIV. OF
804920-010	WI	RESEARCH	WISCONSIN, UNIV. OF
804921-010	CO	RESEARCH	COLORADO STATE UNIV.
804922-010	PA	RESEARCH	FRANKLIN INST. RES. LABORATORIES
804925-010	NY	RESEARCH	CORNELL UNIV.
804931-010	NV	RESEARCH	SPARKS, CITY OF
804932-010	CT	RESEARCH	SIAM INST. FOR MATHEMATICS & SOCIETY
804933-010	IL	RESEARCH	AMERICAN MEDICAL ASSOC.
804937-010	NY	RESEARCH	CLARKSON COLLEGE
804938-010	NY	RESEARCH	SYRACUSE RES. CORP.
804940-010	LA	RESEARCH	LOUISIANA STATE UNIV.&A&M COLLEGE
804943-010	NJ	DEMONSTRATION	E.I. DUPONT DE NEMOURS & CO., INC.
804944-010	NC	RESEARCH	NORTH CAROLINA, UNIV. OF
804946-010	MA	DEMONSTRATION	MARLBOROUGH, CITY OF

1-[illegible]

GRANT NUMBER	STATE	PROGRAM	APPLICANT
804947-010	VA	RESEARCH	VIRGINIA INST. OF MARINE SCIENCE
804951-010	SC	RESEARCH	CLEMSON UNIV.
804953-010	MN	RESEARCH	MINNESOTA, UNIV. OF
804955-010	AL	RESEARCH	SOUTHERN RES. INST.
804957-010	CA	RESEARCH	STEVE K. LEUNG
804959-010	NC	RESEARCH	NORTH CAROLINA, UNIV. OF
804963-010	OR	RESEARCH	OREGON STATE UNIV.
804964-010	CA	RESEARCH	SAN JOSE STATE UNIV. FDN.
804965-010	AK	RESEARCH	ALASKA, UNIV. OF
804967-010	MA	RESEARCH	NEW ENGLAND AQUARIUM
804968-010	OK	RESEARCH	TULSA, UNIV. OF
804970-010	MA	RESEARCH	MASSACHUSETTS, UNIV. OF
804971-010	CA	RESEARCH	HYDROCOMP INC.
804976-010	LA	RESEARCH	LOUISIANA STATE UNIV.
804978-010	MA	RESEARCH	MASSACHUETTS INST. OF TECH.
804979-010	NC	RESEARCH	RESEARCH TRIANGLE INST.
804981-010	MN	RESEARCH	WINONA STATE UNIV.
804988-010	IN	RESEARCH	HOLCOMB RES. INST.
804990-010	CA	RESEARCH	CALIFORNIA INST. OF TECHNOLOGY
804991-010	NY	RESEARCH	CARBORUNDUM CO.
804993-010	VA	RESEARCH	VIRGINIA INST. OF MARINE SCIENCE
804994-010	MA	RESEARCH	JBF SCIENTIFIC CORP.
804996-010	MN	RESEARCH	MINNESOTA, UNIV. OF
804997-010	MN	RESEARCH	MINNESOTA, UNIV. OF
804998-010	VA	RESEARCH	WILLIAM & MARY COLLEGE
805002-010	SC	RESEARCH	CLEMSON UNIV.
805003-010	IL	RESEARCH	ILLINOIS, UNIV. OF
805005-010	FL	RESEARCH	HILLSBOROUGH BD. OF CNTY. COMM.
805007-010	TX	RESEARCH	TEXAS, UNIV. OF
805011-010	NC	RESEARCH	NORTH CAROLINA STATE UNIV.
805011-011	NC	RESEARCH	NORTH CAROLINA STATE UNIV.
805014-010	VA	RESEARCH	VIRGINIA MEDICAL COLLEGE
805016-010	CA	RESEARCH	STANFORD UNIV.
805021-010	MD	RESEARCH	JOHNS HOPKINS UNIV.
805022-010	UT	RESEARCH	RHO CORP.
805031-010	NY	RESEARCH	ST. LAWRENCE E. ONTARIO COMM.
805032-010	WA	RESEARCH	WASHINGTON STATE DEPT. OF FISHERIES
805041-010	CO	RESEARCH	COLORADO STATE UNIV.
805059-010	WY	RESEARCH	WYOMING, UNIV. OF
805065-010	NJ	RESEARCH	PRINCETON UNIV.
900075-02	NE	TRAINING	NEBRASKA, UNIV. OF
900109-051	SC	TRAINING	GREENVILLE TECH. EDUC. CENTER
900128-051	OR	TRAINING	LINN-BENTON COMMUN COLLEGE
900136-065	KS	TRAINING	KANSAS, UNIV. OF
900160-044	MA	TRAINING	MASSACHUSETTS INST. OF TECH.
900194-064	NY	TRAINING	NEW YORK POLYTECHNIC INST.
900228-040	OH	TRAINING	CINCINNATI, UNIV. OF
900313-052	WA	TRAINING	WASHINGTON, UNIV. OF
900443-015	TX	TRAINING	TEXAS A&M UNIV.
900457-014	PA	TRAINING	ASSOCIATION OF ENVRN. ENGR. PROFESSORS
900500-022	NY	TRAINING	CORNELL UNIV.
900501-013	MD	TRAINING	CHARLES CNTY. COMMUN. COLLEGE

GRANT NUMBER	STATE	PROGRAM	APPLICANT
900501-014	MD	TRAINING	CHARLES CNTY. COMMUN. COLLEGE
900520-013	FL	TRAINING	MIAMI-DADE COMMUN. COLLEGE
900538-020	OR	TRAINING	OREGON STATE UNIV.
900540-013	NY	TRAINING	NEW YORK STATE DEPT. ENVRN. CONSERV.
900540-014	NY	TRAINING	NEW YORK STATE DEPT. OF ENVRN. CONSERV
900542-020	FL	TRAINING	FLORIDA, UNIV. OF
900545-020	NC	TRAINING	NORTH CAROLINA, UNIV. OF
900547-020	MA	TRAINING	HARVARD COLLEGE
900553-020	NJ	TRAINING	RUTGERS UNIV.
900557-012	CA	TRAINING	SOUTHERN, CALIFORNIA, UNIV. OF
900558-012	CA	TRAINING	SOUTHERN CALIFORNIA, UNIV. OF
900561-012	OR	TRAINING	LINN-BENTON COMMUN. COLLEGE
900567-020	WV	TRAINING	WEST VIRGINIA, UNIV. OF
900576-011	SC	TRAINING	CLEMSON UNIV.
900591-012	IA	TRAINING	NATIONAL FIELD.RES.CTR., INC.
900591-011	IA	TRAINING	NATIONAL FIELD RES. CTR., INC.
900593-010	CA	TRAINING	SOUTHERN CALIFORNIA, UNIV. OF
900598-010	PA	TRAINING	PENNSYLVANIA STATE UNIV.
900600-010	CA	TRAINING	CALIFORNIA, UNIV. OF
900601-010	MA	TRAINING	BOSTON COLLEGE
900605-010	DC	TRAINING	TECHNICAL INFORMATION PROJECT
900608-010	CO	TRAINING	AMERICAN WATER WORKS ASSOC.
900611-010	MO	TRAINING	LEAGUE OF WOMEN VOTERS
900614-010	MD	TRAINING	CHARLES CNTY. COMMUN. COLLEGE
900614-011	MD	TRAINING	CHARLES CNTY. COMMUN. COLLEGE
900620-010	NY	TRAINING	CONFERENCE OF STATE SANITARY ENGINEERS
900621-010	CO	TRAINING	COLORADO STATE UNIV.
900622-010	NY	TRAINING	CONFERENCE OF STATE SAN. ENGR.
900623-010	DC	TRAINING	LEAGUE OF CITIES-CONFERENCE OF MAYORS
900624-010	NY	TRAINING	CONFERENCE OF STATE SANITARY ENGINEERS
900626-010	NY	TRAINING	CORNELL UNIV.
900628-010	CO	TRAINING	DENVER COMMUN. COLLEGE
900630-010	NH	TRAINING	NEW ENGLAND MUN. CTR.
900632-010	CO	TRAINING	AMERICAN WATER WORKS ASSOC.
900634-010	TN	TRAINING	VANDERBILT UNIV.
900635-010	NY	TRAINING	NEW YORK STATE DEPT. OF ENVRN. CONSERV
900638-011	IA	TRAINING	IOWA DEPT. OF ENVRN. QUALITY
900638-010	IA	TRAINING	IOWA DEPT. OF ENVRN. QUALITY
900639-010	IL	TRAINING	SOUTHERN ILLINOIS UNIV.
900660-013	SC	TRAINING	CLEMSON UNIV.
900664-013	CA	TRAINING	HUMBOLDT STATE UNIV.
900673-010	CA	TRAINING	CALIFORNIA DEPT. OF HEALTH
910520-012	RI	FELLOWSHIPS	RHODE ISLAND, UNIV. OF
910522-011	NE	FELLOWSHIPS	NEBRASKA, UNIV. OF
910528-012	CO	FELLOWSHIPS	COLORADO UNIV.
910573-011	MN	FELLOWSHIPS	MINNESOTA, UNIV. OF
910586-011	WI	FELLOWSHIPS	WISCONSIN, UNIV. OF
910609-011	NJ	FELLOWSHIPS	COOK COLLEGE/RUTGERS UNIV.
910624-011	WI	FELLOWSHIPS	WISCONSIN, UNIV. OF
910659-011	CO	FELLOWSHIPS	COLORADO, UNIV. OF
910694-011	CA	FELLOWSHIPS	SOUTHERN CALIFORNIA, UNIV. OF
910737-010	LA	FELLOWSHIPS	TULANE UNIV.

97

GRANT NUMBER	STATE	PROGRAM	APPLICANT
910742-010	NY	FELLOWSHIPS	COOPER UNION
910751-010	NY	FELLOWSHIPS	COOPER UNION
910767-011	NY	FELLOWSHIPS	COPPER UNION
910770-010	NY	FELLOWSHIPS	COOPER UNION
910771-010	NY	FELLOWSHIPS	COOPER UNION
910772-010	NY	FELLOWSHIPS	COOPER UNION
910782-011	CA	FELLOWSHIPS	CALIFORNIA STATE COLLEGE
910786-010	IL	FELLOWSHIPS	GOVERNORS STATE UNIV.
910787-010	CO	FELLOWSHIPS	COLORADO STATE UNIV.
910790-010	NY	FELLOWSHIPS	RENSSELAER POLYTECHNIC INST.
910797-010	OK	FELLOWSHIPS	OKLAHOMA, UNIV. OF
910798-010	CA	FELLOWSHIPS	SOUTHERN CALIFORNIA, UNIV. OF
910810-011	NE	FELLOWSHIPS	NEBRASKA, UNIV. OF
910826-010	MN	FELLOWSHIPS	MINNESOTA, UNIV. OF
910827-010	NY	FELLOWSHIPS	RENSSELAER POLYTECHNIC INST.
910837-010	MA	FELLOWSHIPS	HARVARD UNIV.
910842-010	CA	FELLOWSHIPS	SANTA CLARA, UNIV. OF
910852-010	IN	FELLOWSHIPS	EVANSVILLE, UNIV. OF
910860-010	CA	FELLOWSHIPS	CALIFORNIA, UNIV. OF
910874-010	SC	FELLOWSHIPS	SOUTH CAROLINA, UNIV. OF
910880-010	NH	FELLOWSHIPS	FRANKLIN PIERCE LAW CENTER
910885-010	NY	FELLOWSHIPS	RENSSELAER POLYTECHNIC INST.
910890-011	SC	FELLOWSHIPS	SOUTH CAROLINA, UNIV. OF
910912-010	NY	FELLOWSHIPS	SYRACUSE UNIV.
910922-010	UT	FELLOWSHIPS	UTAH, UNIV. OF
910924-010	SC	FELLOWSHIPS	CLEMSON UNIV.
910928-012	IN	FELLOWSHIPS	PURDUE UNIV.
910929-011	TN	FELLOWSHIPS	VANDERBILT UNIV.
910938-010	MN	FELLOWSHIPS	MINNESOTA, UNIV. OF
910958-010	NC	FELLOWSHIPS	NORTH CAROLINA STATE
910958-011	NC	FELLOWSHIPS	NORTH CAROLINA STATE UNIV.
910960-010	MD	FELLOWSHIPS	MARYLAND, UNIV. OF
910962-010	SC	FELLOWSHIPS	CLEMSON UNIV.
910963-010	SC	FELLOWSHIPS	SOUTH CAROLINA, UNIV. OF
910964-010	MD	FELLOWSHIPS	MARYLAND, UNIV. OF
910965-010	MD	FELLOWSHIPS	MARYLAND, UNIV. OF
910966-010	MD	FELLOWSHIPS	MARYLAND, UNIV. OF
910968-010	MD	FELLOWSHIPS	JOHNS HOPKINS UNIV.
910969-010	MD	FELLOWSHIPS	JOHNS HOPKINS UNIV.
910971-010	IN	FELLOWSHIPS	PURDUE UNIV.
910972-010	WI	FELLOWSHIPS	WISCONSIN, UNIV. OF

800250

The primary objective of this project is to demonstrate the technical and economic feasibility of the hot air blanching process in the vegetable preserving industry for substantially reducing a major source of pollution and as a means of water conservation. Conventional hot water blanching is employed to inactivate enzymes prior to canning but generates large volumes of waste water with high BOD and solids content. The hot air blanching process which does not use water, inactivates enzymes by heat treatment with combusted gas in a plenum chamber producing only small volumes of steam condensate.

Pilot scale hot air blanching equipment will be modified to provide continuous operation at two processing facilities on five major volume commodities, (spinach, green peas, corn, green beans, and beets). Optimum operating conditions and costs will be determined from consecutive 8-hour runs. Product quality evaluations will be conducted and compared with conventional blanched products. In addition the volume of condensate will be measured and waste water characteristics (COD, ph, SS) determined.

800362

These studies are being conducted to assess the accumulation characteristics and biological consequences of trace organic compounds (chlorinated hydrocarbons and high molecular weight aromatic and aliphatic hydrocarbons) in estuarine ecosystems as a function of the input mechanism, the circulation characteristics and the primary productivity of the areas The specific objectives of the proposed research are outlined below:

1. To provide documentation of existing levels of trace organics in Puget Sound and their fractionation within the primary trophic levels (phytoplankton/zooplankton), suspended particulates, sediments, total water and surface films.

2. To continue the ongoing pulsed and continuous culture studies for obtaining inhibition parameters for short and long term responses of natural phytoplankton and zooplankton populations.

3. To establish a real-time shipboard systems monitoring capability for measuring the important chemical and biological parameters necessary in the interpretation of the observed trace organic distribution patterns.

4. To establish biological criteria for the ecosystem's response to transient perturbations in terms of changes in the important parameters of the system such as pollutant concentrations, biological accumulation and the rates of the system (photosynthesis, nutrient uptake and respiration).

5. To establish a predictive capacity for the biological and chemical stability of the system under current and future trace organic inputs by incorporating the field and laboratory results in a chemical inhibition submodel and the existing general spatial simulation model.

800397

The Select Research Group (SRG) is developing a comprehensive air pollution model designed to enable a control agency to relate air pollution sources to their subsequent distribution in an urban or regional environment. Because progress towards the principal objective requires a broad interdisciplinary effort, the research program has been organized around several integrated subtasks. These include: development of a hydrodynamic model for predicting on a regional basis atmospheric winds and other air pollution-influencing meteorological variables; studies of techniques for modeling atmospheric processes which occur on scales smaller than those evaluated directly by the regional model: development of a closure scheme for the prediction of turbulent fluxes of pollutants; improvement of techniques for remotely sensing and directly measuring meteorological and air pollution parameters in order that the performance of the regional model can be adequately tested and evaluated; studies of the meteorological effects on the properties of air pollutants and pollutant-pollutant interactions; and studies of the removal of air pollutants at the earth's surface.

Significant research completed during the first year of the SRG program included: completion of coding and initiation of testing of the regional numerical model, development and testing of a comprehensive meteorological-air pollution aircraft measurement system, and the design and initial testing of an acoustic sounding system. Aerosol studies have focused on the development and integration of measurement techniques suitable for determining the temporal and spatial variations of both non-hygroscopic and hydroscopic particulates. Special urban, city and rural measurements of atmospheric aerosol using both surface and airborne techniques have been conducted and are being analyzed.

800426

Research related to the quality of irrigation return flow is being carried out at 35 different institutions throughout the 17 Western United States. Related work is also underway at institutions in the Eastern U.S., Canada, Israel and other areas throughout the world. The results of this research are reported in approximately 100 periodicals including experiment station bulletins, technical reports, magazines, and proceedings and journals of professional societies. The objectives of this project are:

1. To pull together published results from related research efforts and make these available to others in the field.
2. To maintain a current summary of irrigation return flow literature within the files of the Water Resources Scientific Information Center EDP facility.
3. To identify gaps in the collective effort and stimulate research to fill these gaps.
4. To promote (and assist in) application of research results to the solution of water pollution problems.

To meet these objectives, a selected list of 100 publications will be reviewed, and articles pertaining to irrigation return flow quality will be abstracted. Abstracts and copies of the articles abstracted will be provided to the Water Resources Scientific Information Center (WRSIC) and to the EPA laboratory at Ada, Oklahoma. Project will begin October 1, 1973 and be completed September 30, 1979.

800665

"Optical Effects of Atmospheric Aerosol" - This grant supports the University of Washington's studies of the optical effects of atmospheric aerosol. The work consists of developing techniques and instrumentation for measuring optical effects, conducting field studies, and interpreting optical effects data, measuring optical effects.

800670

A study to obtain experimental evidence that defines and explains the contribution of natural organix emissions to the photochemical oxidant concentrations observed in problem areas--nonurban and urban. The aim of the first phase of the project is to determine through systematic laboratory experiments the ozone yield in the reaction of NOx with different terpenes and other natural hydrocarbons for varied HC/NOx ratios. The second year's objective extends the research into an area of more sophisticated interest as it regards the identification of the type of intermediate and final products formed in the terpene oxidation reaction. There is evidence to suggest that these reaction products are very active precursors initiating photochemical ozone formation.

800881

A tolerable level of an air pollutant is less than that which causes morbidity in the most susceptible population. The level must also be shown not to have a long range effect of contributing to both morbidity and mortality through the undermining of structural and functional reserves of organs and tissues of the body. An abnormal loss of reserves (hypeinopenia) leads to increased vulnerability to disease in general; and progressive, insidious damage and cell population loss leads to a subclinical disease state (morbility) which places a heavy burden on the functioning cell populations that remain. A prime example of morbility is subclinical emphysema where it now appears that as much as 50% of the total lung tissue can be lost through a covert, destructive process, and yet clinical signs and symptoms are not detected, and pulmonary function tests only begin to show abnormalities. This exemplifies the need for discriminants to determine the influences of air pollutants, singly and in combination, on tissue reserves, and on the development of subclinical "pre-lesions" and "pre-disease" states.

A number of new pathophysiologic and pathobiologic discriminants are being proposed for morbility testing, including measurements of plasma protein loss, overload of epithelial cell protein transport, excessive tissue protein loss, abnormal permeability to tracers (ferritin, peroxidase), altered diphosphoglycerate content of red blood cells, and Type 2 cell hyperplasia and hypertrophy in association with Type 1 cell loss. There will be correlative electronmicroscopy, disc gel electrophoresis, and histochemistry studies. Mice, guinea pigs, and rats will be exposed to nitrogen dioxide, sulfur dioxide, and ozone (singly and in combination). The ultimate goal is the determination of health risks from ambient pollutants as a rational basis for assistance in the establishment of air quality standards.

800916

"Outdoor Simulation of Air Pollution Control Strategies" - The objectives of this grant are: (1) to perform experimental runs on outdoor chamber in order to study O_3, HC, and NO_x relationships; (2) to study LARPP and other field data and reproduce such conditions in a smog chamber; and (3) to conduct a complete data analysis of previous smog chamber data.

801245

The proposed work is a continuation of the evaluation of the use of fly ash as a lake restoration tool. Previous work has suggested that fly ash -- a particulate silicaceous by product produced primarily by coal combustion -- possesses certain properties such that dissolved and sediment bound phosphorus in eutrophic lakes can be controlled. Full scale treatment of a lake has been performed (summer, 1975). The research approach involves both field and laboratory investigations and can be summarized as follows:

1). continued field monitoring of test lake,

2). field evaluation of possible heavy metal accumulations from the fly ash,

3). laboratory sediment-phosphorus transport investigations with and without fly ash layer,

4). desk top data analysis and subsequent preparation of a manual of practice for this restoration technique, and

5). laboratory biological experiments on possible adverse effects of fly ash addition.

802 030

The project will continue studies of the respiratory response of guinea pigs to irritant air pollutants. Special attention will be given to the potentiating effects of trace metals such as copper and ferric iron on the response to sulfur dioxide and the manner in which these metals interact chemically with the metal concerned. Chemical analysis will include the determination of both sulfite and sulfate on the aerosol particles.

802087

The purpose of these experiments is to develop and improve techniques for the rapid identification of viruses found in a polluted water system, and to ascertain whether certain tumors found in poilikothermic animals contain viruses. Leukimias and lymphosarcomas found in Esox lucius will be intensively investigated to determine whether chemical carcinogens act as virus excitors to produce the disease. The previous surveillance showed a 377% increase in tumor frequency. Monitoring of the water and fish for human viruses will be continued.

802160

The goal of this research is to develop experimental and theoretical methods for relating the properties of the pollution aerosol to the characteristics of emission sources. This will be accomplished by starting from the observed chemical and physical characteristics of the pollution aerosol and testing certain hypotheses for the atmospheric changes which occur in the size distribution and chemical composition.

Chief among the atmospheric changes are the growth processes resulting from gas-to-particle conversion of organic vapors, SO_2 and NO_2. By laboratory experiments with atmospheric air samples, data are being obtained on particle growth rates as a function of particle size. At the same time, gas-to-particle conversion rates are being measured by chemical analysis. It is also proposed to initiate a separate set of studies on the deposition of aerosols in models of the human lung. The goal will be to estimate rate of deposition of various chemical species present in the pollution aerosol at points of high deposition intensity.

802172

Objectives for continuation of the study remain the same as listed in the amended proposal of December 5, 1973. In review these are:

1. Establish the effects of application of sludge on forest growth rate.
2. Establish efficient and effective methods of sludge application to the forest.
3. Establish the rate of sludge application which has maximum benefits to forest growth with minimum impact on soil, water quality, and be nonpolluting to surface or ground water.
4. Establish the short-term impacts of sludge application on the forest, including: (a) effects on microbiological organisms and higher plant species, (b) physical and chemical properties of the forest and soil, and (c) soil water chemistry.

We will continue to satisfy objectives 1, 3, and 4 as listed in the original proposal by continued sludge application and study of the Pack Forest plots. Emphasis will be placed on interpretation of forest growth results at Pack Forest to satisfy objective 1.

Major points to be resolved are: at what rates of sludge application can infiltration be maintained and would these application rates cause nutrient enrichment in a soil with adequate reactive surface area.

Two additional study areas are proposed, a fine textured soil with a very high surface area, and the other intermediate textured soil.

Sludge application rates will be reduced to 0.05 and 0.1 inches per week or rates will be increased to 0.25 inch with a bi-weekly application. New plots will be established at Pack to test these rates in addition to applications at these rates to existing plots.

Effects on microbiological organisms and higher plants will be studied on both existing plots at Pack Forest and new plots as per the original experimental design.

802233

The objectives of this research project are to obtain information on lung growth as monitored by pulmonary function testing in a longitudinal population of young children. This study is being performed in an area of low environmental air pollution and the influencr of natural acute respiratory infections with viruses, bacteria and mycoplasmas on the children's pulmonary status is being monitored. Efforts to seek better methods for measuring pulmonary function in young children and to examine the development of immune respiratory defense mechanisms are goals of this study. Thus, the role of both infection and immunity which may modify host response is being evaluated relative to the child's lung growth in an area of low air pollution.

802286

Determination of the lethal effects on warm water fish species, largemouth bass and others to be selected, of short term intermittent doses of chlorine. mainly free chlorine, but some work on chloramines.

802309

The primary objective of the project is to restore Shagawa Lake bordering the City of Ely, Minnesota from a highly eutrophic condition to a healthy state by upgrading the quality of and removing essentially all phosphorus from the City of Ely's high-rate trickling filter plant effluent. A 1.5 mgd tertiary treatment plant has been constructed and is being operated to further treat the trickling filter effluent. Tertiary facilities consist of flow equalization, two-stage lime clarification, dual-media filtration, and chlorination.

802472

"Experimental Study of Aerosol Formation Mechanisms in a Controlled Atmosphere". Investigation of the usefulness of a technique for the collection of organic aerosols in the UNC chamber and analysis by field desorption mas spectroscopy.

802570

The National Council on Radiation Protection and Measurements (NCRP) seeks to collect, analyze, develop and disseminate information and recommendations on radiation protection and measurements and to foster cooperation among organizations concerned with radiation protection and measurement. After identification of an area in which NCRP recommendations would be useful, the Council initiates research aimed at:

1. Assessment of the available information which is pertinent to the problem.
2. Identification of areas where more information is needed.
3. Synthesis of present knowledge relevant to the problem area into practical recommendations on radiation protection and measurement which also highlight areas in need of further study.

This project is concerned with the following topics (1)radiation hazards resulting from the release of radionuclides into the environment (with particular attention directed to the examination of the problems connected with the release of iodine-129),(2)environmental radiation measurements,(3)tritium measurement techniques for laboratory and environmental use and (4)quantities,units,measurement techniques,biological effects and exposure criteria for radiofrequency electromagnetic radiation.

Initial work on NCRP studies are carried out by scientific committees. If preliminary study by a scientific committee justifies it, work is begun on the formulation of draft recommendations. This involves a detailed examination of pertinent information already available,identification of areas in which information is meager or unavailable, and an assessment of the scientific thinking on the problem at hand. The final result of the scientific committee's work is usually a draft of a proposed NCRP report. This draft is submitted to the members of the Council for review,modified on the basis of Council Member comments and finally, after membership approval, published.

802596

(1) Objectives

1. Development of diesel exhaust particulate matter characterization data on a turbocharged diesel engine using: i) the Andersen Impactor in conjunction with the Scanning and Transmission Electron Microscopes, ii) the particle size distribution using the Thermo-Systems Model 3030 electric aerosol analyzer, and iii) the concentration of the sulfate fraction of the particulate matter.
2. Development of a total hydrocarbon balance using a Flame Ionization Detector (FID) to measure total hydrocarbons in the undiluted and diluted exhaust.

(2) Approach / (3) Plans

The above objectives will be carried out using a special test setup designed and developed under this grant during the first two years. The test setup has a undiluted exhaust test section, and a dilution tunnel that simulates the ambient dilution of diesel exhaust. A Cummins VT-903 turbocharged engine will be used for these studies. The engine will be operated on the EPA 13-mode cycle. These data will be used to analyze the effect of load and speed on the chemical and physical character of diesel exhaust particulate matter using the measurement methods outlined in the objectives.

802736

Development and improvement of quantitative methods for concentrating and detecting small amounts of viruses in large volumes of water (river, potable, renovated, estuarine, and ocean water).

802759

The proposed research program is to apply mathematical methods to monoenergetic photon excitation, energy dispersive X-ray fluorescence analyzers in the elemental analyses of particulates on filter paper. The major objective is to automate this method of analysis as much as possible. To accomplish this, five individual objectives can be identified. These are: (1) Obtain or develop if necessary the standard computer programs required to: (a) gain shift spectra to obtain a standard pulse-height calibration and (b) to identify characteristic X-ray energies; (2) Develop the least-squares matrix approach for determining X-ray intensities from pulse-height spectra; (3) Develop the mathematical models necessary to determine elemental compositions from X-ray intensities; (4) Develop the computer software and data handling techniques necessary to implement the methods described; (5) Demonstrate the computer automation on a prototype X-ray analyzer. Objectives 1, 2, and 3 have essentially been accomplished. The major portion of the work during the present period will be devoted to Objectives 4 and 5.

802827

Certain microorganisms (i.e., total and fecal coliform, fecal streptococci) are of questionable value in assessing the degree of sewage pollution in fresh, marine, and estuarine waters used for recreational purposes. Before other microbes can be evaluated for potential use in this respect, methods for their rapid and specific detection must be available. The use of pathogenic yeasts as pollution indicators has not been studied in any detail, despite their retention of viability and infectvity in various natural waters. Accordingly, this research will concentrate on the development of a medium which will detect quantitatively small numbers of viable C. albicans cells in water using the membrane filter technique. Laboratory studies will include several cultural variables; pH, temperature, organic nutrients, growth inhibitors of both bacteria and yeasts. Media currently used for mycological studies will serve as controls and for comparative purposes. Final evaluation will involve testing of field samples of waters and effluents taken from various areas of differing salinity.

802890

The proposed research program is a continuation of the project designed to determine lead concentrations in the teeth of young children as well as in contaminating dust samples from the homes of donors and air samples from the immediate area. In addition, automobile traffic rates in the immediate area will be studied and socio-economic data collected on the families of children under study. The samples are being collected in Birmingham, England, a city which offers a unique laboratory for such a study, i.e. a tremendously large clover leaf, around which are constructed many high rise apartments and a state housing development.

Additional analysis will be run on lead levels in blood collected from the donors. Correlations between lead levels in teeth, dust and blood will be made with socio-economic data, children's cavity count and school achievement records.

It is expected that the correlation between automobile traffic, lead accumulation levels student school achievement and mobility patterns will be shown.

803069

This Short Course is a follow-up to the Short Course "Applications of Stormwater Management Models", sponsored by the EPA and held August 19-23, 1974 at the University of Massachusetts. The objective of the 1975 Short Course is to present the practitioner with concepts and modeling techniques used for prediction, control and management of urban stormwater problems. Emphasis will be placed on the EPA Stormwater Management Model; workshops are designed to acquaint attendees with the preparation of data input for the computer model. Participants are expected to be from consulting firms and government agencies specializing in design and management of water quality.

The Short Course is scheduled for five days in late July 1975 at the University of Massachusetts. A presentation of the common components of stormwater management models will be followed by detailed description of the EPA SWMM. Three workshops on data preparation for the Rainfall-Runoff, Transport, and Storage and Treatment Blocks as applied to a Case Study will then focus on needs of the practitioners. Lectures on field data collection for model calibration and the impact of stormwater on receiving water quality will also be included. The Short Course will end with the presentation of comparative case studies on use of the EPA SWMM for design and the WRE STORM for planning decisions. A Short Course Notebook will be prepared with the aim of providing an instructional lecture rather than seminar format.

803078

A study of the identity and sources of atmospheric aerosols. The grantee will use the techniques of polarizing light microscopy to determine the morphology of suspended particles with diameters greater than 5 micrometers.

803079

1. Objectives of this study are to demonstrate the effectiveness of several surface configurations in: controlling erosion, runoff, sedimentation and pollution of adjacent drainages; quickly producing a desirable stabilizing vegetative cover; creating an equilibrium between precipitation absorbed and soil moisture evaporated and transpired so that ground water pollution will remain minimal; producing an overall desirable reclamation design providing effective drainage, esthetics productiveness and use.

2. Surface coal mined demonstration areas ranging in size from sixteen to thirty hectares were implemented near Colstrip, Montana, Savage, Montana and Beulah, North Dakota. Two additional demonstration areas are being implemented, one at the Seminoe No. One Mine near Hanna, Wyoming and the other at the Dave Johnston Mine located near Glenrock, Wyoming.

3. Intensive meteorological, surface runoff and water aquifer level monitoring is being accomplished with automatic data acquisition systems at the three demonstration areas implemented. Five 0.21 hectare microwatersheds have been constructed at each area to evaluate each of five surface manipulation treatments: chiseling on raw spoils, gouging on raw spoils, chiseling on topsoil, gouging on topsoil, and dozer basins on topsoil.

Key Words: reclamation, erosion control, sedimentation, water pollution, revegetation, surface manipulation, pitting, infiltration, leachate, ground water, runoff, hydrology, watershed

803090

The proposed work is to investigate the feasibility of utilizing for fishes clinical procedures which are accepted in determining the status of specific organ function in man. The relative hepatotoxicity of two chlorinated benzene compounds, hexachlorobenzene and 1, 2, 4, trichlorobenzene will be investigated in rainbow trout (Salmo gairdneri). The hepatotoxicity of each compound to trout will be assessed through clinical procedures which have previously been established as sensitive indicators of liver function in this fish. Histopathological studies will be conducted to correlate specific liver pathology with the degree of apparent functional impairment. The study will evaluate liver function in the trout following regimes of both subacute and chronic exposure to the proposed toxicants.

803113

The primary objective of this project is to determine the rate and chemical nature of heavy metal releases from polluted sediments to estuarine and coastal waters and their biological systems, and to examine the importance of these releases in light of other heavy metal fluxes and cycles in these environments.

803 143

1. Objectives - a. To establish replicate, flow-through marine plankton microcosms under controlled conditions in the laboratory
   b. To use these microcosms to measure the effects of different intensities of sewage-related stress on the stability and resiliency of coastal plankton systems.
   c. To measure the effects of interacting and time-varying stresses associated with ocean dumping on the microcosm.

2. Approach - Whole water samples of the coastal plankton community in lower Narragansett Bay, RI, will be maintained in flow-through laboratory microcosms with a turnover time of 20 days. A comples artificial sewage and a mortality strees will be applied singly and in combination continuously and in time-varying mode to replicate tanks at various intensities.

3. Current Plans - A number of commonly used ecological parameters, including population levels, diversity, nutrients, particle size distributions, pigment levels, and photosynthetic and respiratory activity, woll be followed to measure system responses and recovery once the stresses are removed. Stress-response curves for the system using these parameters will be prepared for use in accessing and predicting the effects of similar stresses from field measurements in natural systems.

803154

The objective of the proposed research are to study the short and long term effects of cadmium on the ultrastructure of type A spermatogonia along the basement membrane of the mouse testis. For the short term study male CD-1 mice will be injected with a single sublethal dose (2mg/kg) of cadmium acetate and cadmium chloride. The mice will be sacrificed at designated time interval after injection and the tissues prepared for electron microscope analysis. For the long term study mice will be give protracted doses of cadmium acetate and cadmium chloride in water over an extended period. The short and long term effects of cadmium on the ultrastructure of type A spermatogonia will be determined.

803188

Selected carbonaceous solid wastes will be utilized for the production of activated carbon. The following will be used as source material: (a) mixed waste paper, (b) magazines, (c) short fibers from repulping processes and (d) agricultural or other waste products.

The size and orientation of carbon crystallites formed during pyrolysis will be studied as a function of temperature, time and atmosphere. The ranges of variables will be extended sufficiently to allow estimation of the optimum pyrolysis conditions.

Carbons will be used to remove mixed organic solutes from pure solution and from municipal wastewater. Operating parameters for reactivation or regeneration of the spent carbons will be determined.

The heterogeneous nature of the source material for refuse activated carbons and the associated ash indicate that heavy metals may be leached into the treated water. Ash materials will be analyzed for heavy metals and experiments designed to determine the extent of leaching of the heavy metals into solution.

803215

"Investigation of Bioenvironmental Impact of Fossil Fuel Fired Power Plant in the Fort Union Basin of Montana." Assessment of the effects of a coal-fired power plant on indigenous vegatation.

R 803218-01-6

SPRAY-FUNOFF TREATMENT OF MUNICIPAL WASTEWATERS
Supplemental request to complete funding for the current 16-month project extension to allow for collection of operating data for two full growing seasons.

803242

Objectives The objectives of the research on coal nitrogen are to obtain a better understanding of the processes contributing to the emission of nitrogen oxides from coal-fired utility boilers in order to help define better control strategies. The objectives of the research on particulate organic matter (POM) are to determine, within the flame and the exhaust gases of laboratory combustors, (a) the size distribution and concentration of soot particles, (b) the identities and concentrations of organic compounds, and (c) to the extent possible the relationship between the soot and the organic compounds.

Approach The approach in the coal nitrogen study is to close a nitrogen material balance by analyzing solid and gaseous products of the pyrolysis and oxidation of seven pulverized coals under a range of conditions simulating those to be expected in utility boilers. The study of POM is based on the collection of samples, using a molecular-beam instrument in low-pressure premixed flames and a water-flushed probe in diffusion flames at atmospheric pressure, and sample analysis by high resolution electron microscopy, online mass spectrometry, and combined GC/MS.

Current Plans and/or Progress Results on nitrogen retention in char have been obtained as a function of temperature and time for two coals. The plans include study of five additional coals being studied by other EPA contractors, use of a wider range of furnace temperatures and methods of coal injection for the oxidation experiments, collection of data on gas phase constituents of pyrolysis, and characterization of the coals and chars in order to develop mechanistic models for data extrapolation. The POM study has demonstrated the use of GC/MS for the analysis of polycyclic organic hydrocarbons (PCAH), characterized the soot and PCAH in a turbulent diffusion flame as a function of several burner conditions, and developed the molecular beam-mass spectrometer apparatus. The plans include collection of additional data under a range of conditions to facilitate the modeling of soot and PCAH formation and burnout in the turbulent diffusion flames.

803255

Experiments performed in our laboratory suggest that the ability of coliforms to populate the gastrointestinal (GI) tract of warm blooded animals is related to their endogenous levels of lysine decarboxylase (LDC). That is, those coliforms with a high endogenous LDC content may have a selective advantage in establishing themselves in the GI tract over those coliforms with a low endogenous LDC content. These results suggest that the ability of a coliform to synthesize cadaverine endogenously (1,5-diaminopentane) may determine whether it is of fecal origin. We plan to test this hypothesis more directly by introducing LDC positive and LDC negative coliforms into the GI tracts of warm blooded laboratory animals and determine the washout rate of these organisms from the GI tracts of these animals. In addition, we plan to isolate coliforms from the feces of human volunteers and determine directly the endogenous LDC levels of these organisms. In this way, it may be possible to redefine more accurately the term "fecal coliform" and develop a simple, accurate, *in situ* test for fecal contamination of both recreational and drinking waters.

803286

The objective of this project is to demonstrate the effectiveness of an evaporator-incinerator system for disposal of concentrated wastes high in dissolved solids and organic materials. The process uses evaporation, crystallization, fluid bed drying, pyrolysis, and thermal oxidation in accomplishing these results. The process will also utilize waste heat recovery and air emission control. The inputs to the system are waste products, fuel, air, and acid for neutralization. The products produced are sodium chloride and sodium sulphate salts as dry solids, sodium carbonate dissolved in scrubber water, CO_2, water vapor and other combustion products.

The process will be demonstrated by operating equipment presently being manufactured and constructed at the applicant's manufacturing facilities in Barceloneta, Puerto Rico. Tests will be made to determine the effectiveness of the apparatus in removing organics and dissolved solids from pharmaceutical and similar wastes.

803291

Our study on the River Nile in Egypt addresses itself to the impacts of the Aswan High Dam on water quality in Lake Nasser Reservoir and downstream portion of the river. These impacts are being measured in terms of physical, chemical, and biological parameters. In human terms, these impacts are examined with special reference to agriculture, public health, and socioeconomic effects.

During 1975 and 1976, a country-wide water quality monitoring network along the River Nile and Lake Nasser was established. This is supplemented by functional studies which integrate across the discrete geographic boundaries of the system and include studies of plankton, benthos, hydrophytes, and fisheries. The gathered information is being fed to an environmental information storage and retrieval system.

Public health impacts studies have been solely concerned with the effects of changes in water resources in rural Egypt. Agricultural impacts studies are based on laboratory and field assessment of the effects of lack of silt, water logging, and salinization on soil fertility and agricultural production. Socioeconomic impacts studies are concerned with the assessment of alternative strategies in a policy context useful to the decision maker.

803299

In recognition of the fact that an increased use of platinum compounds is being considered in a wide variety of industries including, petroleim (platinum based catalytic enzymes to raise the octane content in gasoline) automobile (in exhaust system) and well established autimitotic activities of certain platinum compounds on biological system, it is very pertinent that its potential as an environmental health hazard to man be carefully evaluated.

Because of the sensitivity of the system, cost, time, ease of experimentation, and most of all, its relevancy to man, mammalian cell culture system (TK locus of mouse-lyphoma cell line, L 51784) will be employed to estimate the mutagenic potential of platinum compounds. Arachis test system has been included in the study to further test these compounds under in vivo system to supplement results. The information obtained from this study may be used to establish the criteria for regulating the permissible level (if any) of platinum in the environment.

803322

Objectives:
To develop and use methodology to monitor changes in native grassland communities due to fossil fuel power plants.

Approaches:
Include diversity, phenology, and aerial photography analysis.

Progress:
Diversity indices have proven sensitive to seasonal and annual changes in plant community structure. Their application to known air pollution levels is being studied now, preliminary data are promising.

Phenologic observations are being collected for a third summer. For most species, developmental sequences are strongly correlated with climatic variation, so yearly confounding exists. The data indicate the need for more intensive early-season observations. Relationships with pollution effects are not yet clear.

Low-level (500-3000') aerial photography appears very effective in recording pollution effects under controlled application rates. Color (density) enhancement is useful in displaying treatment differences.

803336

Beneficial Disposal of Water Purification Plant Sludges in Wastewater Treatment.

To finance the completion of the ongoing work.

803343

The general objective of this investigation will be to investigate, on a full plant-scale basis, ammonia nitrogen removal utilizing the breakpoint chlorination process. Particular attention will be directed to those aspects of breakpoint chlorination which are important to cost-effective design and operation of the process. Specific emphasis will be placed on instrumentation--process control, reaction kinetics and other process considerations.

The breakpoint chlorination demonstration project will include one full year of process operation. The first nine-month period will include utilization of a full-control system. During that time, data will be collected which will provide the basis for a long-term evaluation of process efficiency and the effectiveness of the instrumentation control scheme. Specific investigations into the importance of mixing intensity in the zone of chlorine application, the role of pH in controlling reaction end products and consideration of reaction kinetics will also be conducted during that period. Our consultants will provide the framework for continuing evaluation of the breakpoint process and will provide the detailed on-site technical personnel for the specific process investigations. Operating personnel will provide two shifts per day, seven days per week operations control over the system.

The final three months of operation will be accomplished utilizing less sophisticated control techniques. The purpose of this investigation will be to evaluate the actual level of control which is needed to properly maintain the process. Less rigorous control schemes might include utilization of only downstream chlorine residual and flow signal information for pacing the feed rate of chlorine to the breakpoint system.

803346

The sole purpose of disinfecting potable water supplies is the destruction of pathogenic organisms and, thus, the elimination and prevention of waterborne disease such as those caused by viruses. The overall objective of the study is to determine the range of sensitivity of various enteric viruses (e.g., picornaviruses) to chlorine. Using carefully controlled laboratory experiments, the sensitivity response will be characterized with respect to such variables as type of virus, level and nature of chlorine, and degree of aggregation. Chlorine demand free water, buffered at various pH values, will be used as the suspending medium. The sensitivity of viruses continuously maintained under laboratory conditions will be compared to new isolates obtained from fecal matter. The mechanism of inactivation, with respect to whether the viral genome or protein coat is affected, and whether the inactivation is reversible, will also be examined.

803370

Overall Objectives

A four-year study of New York Harbor and adjacent waters is proposed by the Louis Calder Conservation and Ecology Center of Fordham University in conjunction with the New York Ocean Science Laboratory. From an overall point of view the main objectives of this research will be:

1. to provide information relevant to the kinds of treatment necessary for municipal waste discharge into coastal waters and
2. to provide information relevant to how the results of various treatments might influence water quality;
3. to determine how changes in water quality may lead to massive algal blooms (noxious and/or toxic) in these waters;
4. to determine whether the quality of the waters in New York Harbor is being affected by materials flowing into the area from the old offshore sludge dumping sites or from newly established ones;
5. to determine the toxigenicity of these materials to the primary producers is reflective of changing water quality;
6. to construct through cooperative and integrative efforts a dynamic and predictive model system for this area to be used in the economic, sociological and scientific planning for the future development of water resources in this area.

803389

Investigations are being conducted on the utility of ion selective electrodes for measurement of atmospheric particulate nitrate concentrations. This program which has been conducted for the past 18 months has provided substantial information regarding nitrate electrode chemistry. Over 100 particulate samples have been measured with various types of selective electrodes and the obtained results compared with other nitrate measurement techniques. This work will be extended to include organic carbon measurement and characterization on similar samples. The methodology which will be developed to meet these objectives includes various oxidation techniques and selective solvent extraction coupled with high performance liquid chromatography. Included in these efforts will be a detailed evaluation and comparison of the results obtained from the different oxidation techniques using a variety of sample types.

803395

The study involves the characterization of a recently discovered virus of the pink shrimp, Penaeus duorarum. The relevance of this study resides in the fact that the shrimp virus is remarkable similar to insect viruses of the Baculovirus group which are being applied as biologial pesticides for the control of certain agricultural insect pests. This is the first report of a virus structurally similar to the occluded insect viruses as infecting invertebrates other than insects. The research will direct activities toward investigating the biochemical, structural and biological properties of the shrimp virus as compared to known similar properties of the insect granulosis and nuclear polyhedrosis viruses. Characterization of the shrimp virus will aid in developing specific monitoring systems for the detection and survey of the disease as it exists in nature and thereby evaluate the extent of seriousness. Also, such studies will begin to increase our understanding of the capability, or potential capability, of certain viruses being utilized as biological pesticides in non-target invertebrate systems, and conversely.

803399

The objective of the study is to evaluate long path laser monitoring of ambient level air pollution. The lasers which have been considered are semi-conductor diode and sequentially step tuned carbon dioxide types. Systems employing both types were tested during the summer of 1974 in St. Louis in connection with the Regional Air Pollution Study (RAPS). The diode laser system was tested in St. Louis during 1975 and will be tested again in 1976.

It is expected that the diode laser system will be used in St. Louis during 1976 for pollutant variability.

A step tuned laser system will be tested in Syracuse, New York and demonstrated to various Environmental Protection Agency groups in the spring of 1977.

803407

This project involves the study of biological nitrification of two different municipal wastewater treatment plant effluents, (type A) a high-rate trickling filter plant effluent and (type B) a continuous-flow, two-stage, facultative lagoon effluent.

The effluents from each of these plants contain unoxidized nitrogen compounds in the form of organic and ammonia nitrogen. Two rotating biological contactor (RBC) pilot plants will be designed, fabricated, and installed, one each, at the effluent end of the above two full-scale treatment plants. The principal objective of this research project is to operate and monitor these pilot units to determine whether RBC's can induce nitrification of and some incremental overall quality improvement in the effluents of either or both of these plants. If the results are positive, the secondary objectives will be to optimize performance and generate design factors for extrapolation to construction of larger-scale second-stage RBC nitrification systems.

R 803452-01-0

LONG TERM RECHARGE OF TRICKLING FILTER EFFLUENT INTO SAND
Supplemental funding to allow for an intense study of hydraulic monitoring of radioactively tagged municipal wastewater applied to infiltration basis to be completed within the original project period.

803459

The purpose of this project is to develop and demonstrate an optimum design chlorine mixing and contacting system that will provide effective disinfection with low chlorine-induced toxicity. Trailer-mounted chlorination and bioassay facilities will be evaluated in parallel with chlorinated effluents of existing full-scale wastewater treatment plants.

803490

This investigation comprises a study of the applicability of electrochemical systems and procedures to the detection of inorganic species in industrial and domestic wastes. By utilizing the techniques of anodic stripping voltammetry (ASV), cathodic stripping voltammetry (CSV), and scanning coulometry with the conducting glass electrode (CGE) and the composite mercury graphite electrode (CMGE), it should be possible to effect the rapid analysis of trace metals and other inorganic substances in complex matrices. In addition, this study should be instrumental in providing a method for the rapid evaluation of stability constants of metal complexes in industrial and domestic effluents.

803509

The objective of this project is to develop an optical instrument based on measurement of the degree of depolarization of back-scattered radiation for monitoring the mass concentration of particulates in stack emissions.

803520

The primary objective of this project is to measure the emission of sulfuric acid aerosol from a population of catalyst vehicles as they accumulate mileage in normal use. At approximately 5,000 mile intervals, each vehicle undergoes a comprehensive emissions test consisting of the following sequence: (1) a 1975 Federal emissions test (FTP), (2) a one-hour 50 mph steady cruise, and (3) a series of five tests following a "sulfate driving cycle" developed by the EPA. In addition to measuring carbon monoxide, hydrocarbons, nitrogen oxides and SO_2, a dilution tunnel with iso-kinetic sample probes are used to collect filter samples for sulfuric acid and total particulate mass measurements from each test segment. Analysis of particulate sulfate mass is by the barium chloranilate (BCA) method, and X-ray fluroescence for mass emission rates of ten selected elements: lead, sulfur, phosphorous, platinum, calcium, silicone, copper, aluminum, zinc and iron. Fuel economy is measured by carbon balance technique, and between test intervals by an in-line totalizing fuel meter installed on each vehicle. Tank fuel is collected at each test and analyzed for trace components, especially sulfur content. Prior to each test, each vehicle is diagnostically examined for tune-up condition. Over 130 completed test sequences on 50 cars have been completed in this second year of a three-year project. Under a modification to the scope of work, real-time analyses of emissions before and after the catalyst are being added to the original test procedure. These data will permit a more detailed analysis of catalyst and engine performance and their interplay as it affects overall emissions.

The proposed third year effort will include (1) continuance of testing on existing fleet, (2) addition of real-time data acquisition to measure converter performance, and (3) expansion of fleet to include 1977 model year vehicles and increase to fleet size.

R 803525-01-4

COMBINED MEMBRANE AND FREEZING CONCENTRATION OF BLEACHING RECYCLE WATERS
The bleach plant is a major source of colored effluent in an integrated pulp and paper mill. The objective of this project concerns the on-site evaluation of reverse osmosis and freeze concentration as a practical combined system for treating or eliminating this effluent.

803540

This research proposes to determine the combustion temperature and residence time required to effectively destroy pesticides. Thirty-four different pesticide compounds will be examined. Evolved gas analysis will play a major role in measuring degree of thermal decomposition.

Thermogravimetric analysis, supplemented by trapping and subsequent analysis of evolved products, will be utilized. Modified pyrolysis-gas chromatography will be used to accurately determine temperature, residence time, and completeness of thermal decomposition.

803547

The projects main objectives are to determine the nature and extent of Non Point Nutrient and B.O.D. pollution in a 340 square mile watershed and evaluate its effect on a 7000 acre reservoir receiving this runoff. This will be accomplished by using two mathematical models. The first to define and allow predictions of the relationship between land use and land management on the extent of non point pollution, the second to describe the oxygen relationships of the reservoir management will be needed to decrease eutrophication and oxygen depletion.

Studies of water chemistry and B.O.D. on about 80 sample sites along with a land use survey are being made in the entire watershed. Additional studies in the reservoir include long term B.O.D. analysis, algal studies, primary production and sediment oxygen-nutrient relationships. A study of various reservoir drawdown levels on reservoir water quality are being done.

Progress thus far has been to determine total nutrient loading; correlate primary production to chlorophyll; construct sediment maps; determine long term B.O.D. constants and collect most of the Land use survey information.

803602

The project objectives are to develop and demonstrate automated control schemes for sludge handling processes used at wastewater treatment plants and compare their performance and cost effectiveness with conventional control methods. Specific objectives for the year 6/22/77 to 6/21/78 are as follows:

(1) Complete evaluation of thickener underflow pumping control scheme and prepare project report.

(2) Demonstrate automated control of a vacuum filter. Initially control loops that do not interact will be instituted such as vat level control, vacuum control and pH control of both the ferric chloride and lime conditioned sludge. Later during the year several integrated control schemes will be initiated to control cake moisture content and dry solids production rate. A mini computer system is currently being constructed to monitor system performance and take control action as required.

(3) Design and implement an integrated control system for the multiple hearth incinerator used to burn the cake produced in (2) above.

All work will be carried out at treatment facilities currently operating and under the constraint that no adverse effects on effluent quality are allowable.

803607

This project will evaluate existing mathematical models for the purpose of developing a nitrogen movement and transformation model to be tested on existing field data.

803 611

The objectives of the project are to develop and/or demonstrate remote sensing techniques for mapping Cladophora using passive multispectral scanner data collected from low aircraft altitudes, and to define the capability of passive multispectral remote sensing for estimating Cladophora biomass.

Remote sensing and supporting field data will be collected during June 1975 over a 5 km. study area along the shoreline of Lake Ontario at a location near Rochester, New York. Processing of multispectral scanner data will include both analog and digital techniques to show the distribution of Cladophora and to relate spectral characteristics to standing crop.

803634

It is the objective of this project to develop a strategy of insect control in which a complex of closely-related species (apple pests) is controlled with a defined mixture of pheromone components. A number of species, e.g. the redbanded, obliquebanded, threelined and fruittree leafroller moths, use the same pheromone components but in different ratios and with the addition of other components. Tests will be conducted to define the effect on pheromone trap orientation by permeating the air with each component alone and then in certain mixtures. The best disruptant will be used in pilot studies in which flight orientation and mating efficiency are monitored. If positive results are obtained, the method will be used in a pest management project now underway in New York apple orchards. Pheromone components will be emitted from hollow fibers.

S 803656-01-2

TRUCK WASHING TERMINAL WATER POLLUTION CONTROL
This project will demonstrate in full-scale a physical/chemical/biological treatment process for treatment process for treatment of wastewaters generated during the internal washing of tank trucks. The economics and effectiveness of each of the unit processes to be utilized, i.e., sedimentation, air flotation, filtration, carbon adsorption, and biological treatment will be determined. The feasibility of reusing the treated wastewater and reclaiming the oily fractions as fuel will also be studied.

803660

Objective of study is the correlation of observations of aerosol size and composition distributions in the atmosphere and in smog chambers with the theory of aerosol dynamics through mathematical descriptions and numerical simulation of the basic growth processes of particulate matter. Currently simulation has been achieved of urban pollutant episode conditons using K theory for particulate matter. Work is underway to include simulation of chemical processes occurring in the atmosphere.

803684

The first objective of this project is gather, summarize and interpret available data concerning potential impacts of oil shale development upon the water quality hydrology of the affected regions. The purpose is to ascertain the adequacy of these data for assessing and managing water quality.

The second objective is to experimentally and theoretically study the movement of soluble salts in spent shale residues. The purpose is to assess the potential for root-zone salinization and the deep percolation of saline waters. Movement of salts in spent shale residues will be studied in large scale volumetric lysimeters and by a mathematical model.

803692

The objective of the grant is to study the problems associated with the extraction and measurement of particulate pollutants in hot stack gases. The third year will be spent investigating particulate pollutant losses in probes due to inertial impaction, gravitational settling, centrifugal forces and turbulent deposition.

803705

This proposal seeks to use biochemical screening procedures of various kinds to identify active fractions of high molecular weight organic compounds of diesel engine exhaust for more extensive organic analysis and structure elucidation.

803719

The objective is to critically examine the basis for the indirect measurement of particulate matter mass concentration by the use of contact electricity as the detection mechanism. A study of the literature has been made and a contact-electricity type of monitoring instrument has been tested in the laboratory. The total charge has been found to correlate well with gravimetric mass. The response of the instrument depends mainly on the electrical resistivity of the material. The condition of the surface of the probe has a major effect on the sensitivity. Further tests will be made to investigate the effect on the instrument performance of the condition of the probe surface, particle size, and other relevant parameters.

803726

The overall objective of this research effort is to develop a model capable of simulating the transport and runoff of agricultural chemicals from relatively large stream basins. Such basins are distinguished by the contribution of all components of streamflow (surface runoff, interflow, groundwater flow), whereas smaller watersheds provide only the surface runoff and interflow components.

The intent is to expand the scope of the Pesticide and Nutrient Transport and Runoff (PTR Nutrients) Model developed by Hydrocomp and the EPA Southeast Envoronmental Research Laboratory (SERL), in Athens, Georgia. The PTR Nutrients Model simulates the movement by hydrologic mechanisms of pesticides and nutrients on small watersheds. Numerous complex mechanisms determine whether or not pollutants washed off these small watersheds will be included in the total pollutant load leaving the basin. These mechanisms include channel routing of flow and soluble pollutants, and scour and deposition of sediment (and attached pollutants) in stream channels. In addition to these processes, the research effort will investigate and model the differing behavior of both forested and agricultural lands.

In summary, the basin model resulting from this study will be applicable to the evaluation of pollutant contributions from basins composed of both forests and croplands. In addition, data produced from aerial remote sensing will be examined and analyzed for possible use in model application.

KEYWORDS: Simulation, hydrology, sediment transport, pesticides, remote sensing

803738

A methodology has previously been developed for the study of metallic wastes in combined domestic and industrial sewage. The methodology is based on general chemical models of the waste and of various dilutions of the waste with seawater and has been applied to the specific case of the Los Angèles County wastewater discharge.

It is proposed to extend and improve this work using a new case study such as the dumping of concentrated acidic metallic wastes. The proposed work will involve inclusion of new chemical data in the model, improvement of existing computer program for efficiency and convenience, simplification and generalization of absorption subroutines and, if necessary, implementation of specific kinetic subroutines related to the acid waste disposal problem.

The goal of the project is to improve our predictive capabilities for routine use in the various monitoring, impact assessment and regulation activities associated with metallic waste disposal.

R 803742-01

NICKEL RECOVERY AND POLLUTION CONTROL BY ELECTRODIALYSIS

Under sub contract Micro Pore Research will construct and install at Risdons plant a electrodialysis system based on recent micro pore technology. It will be designed to remove a minimum of 500 g/hr nickel from a 0.5 g/l first rinse solution and 3 g/hr from a second .01g/l rinse tank. The unit will operate to close the loop on the Watts type nickel rinsewater, thus reducing the overall plant waste load and volume handled by the chemical treatment system. Economic factors are the recovery of the nickel solution and the reduced cost of the chemical treatment system.

803755

This project will examine the influence of dosage on the disposition and metabolism of various ^{75}Se-selenium compounds administered to rats in drinking water and will investigate the quantitative and temperal relationship of selenium and GSH-peroxidase activity in tissues where GSH-peroxidase may exert a protective effect against oxidative damage of membranes and other cellular elements. Three approaches will be used in this investigation: I. Examine the absorption, distribution and excretion of ^{75}Se-selenium and the influence of dosage and chemical form on those parameters in experiments ranging up to 24 hours; II. Investigate the biotransformation of inorganic and organic selenium compounds and the relationship of selenium to the hepatic mixed function enzyme system; III. Measure the absorption and distribution of ^{75}Se-selenium administered chronically in drinking water and study the influence of various factors, such as mineral content in the water and dietary fat, carbohydrate, or protein intake.

The information generated by these investigations will provide a more rational basis for determining the range between nutritionally adequate and toxic levels of selenium in drinking water.

803764

The purpose of this proposed study is to determine the point in time and the radiation dosage level at which the life span shortening effect begins to exert itself in white rats. A minimum of 300 Sprague-Dawley pregnant rats will be used. They will be exposed to 6.6, 26.0, 46.0 and 66.6 rads of chronic radiation (tritiated water - HTO) during pregnancy. The pregnant rats (determined by vaginal smears) will be weighed and placed in individualized cages for observation. We will get the cages and glove boxes from the Research Triangle Park (RTP), possibly on a loan basis. Our small animal room will be air conditioned and an exhaust system will be installed.

The rats will be initially exposed at the RTP and transferred to St. Augustine's College for observation.

Rats that show signs of stress, i.e., weight loss or sickness will be sacrificed and the pathology of selected tissues will be done. The pathological condition of sick rats will be compared with healthy rats. The results of these observations over a long period (3 to 4 years) of time should give some indication of the onset of the life shortening phenomenon as brought on by chronic HTO irradiation at 6.6, 26.0, 46.0 and 66.6 rads.

803769

The objectives of this project are to confirm and demonstrate the technical and economic feasibility of disposing of sewage sludge in combination with municipal refuse in an oxygen converter system, and to establish the environmental effects of this means of disposal. The project will be carried out at Union Carbide's full scale test facility. The demonstration plant will process 150 TPD of municipal refuse and 40 TPD of wet sewage sludge.

803 773

Project objectives are demonstration of solvent extraction as a treatment method for wastewater from various acetic-acid manufacture processes, as well as determination of the most attractive process configuration choice of solvent (s) and operating conditions. Experimental information will be obtained on composition of wastewaters, equilibrium with solvent phases, efficiency of extraction in a mini-plant RDC countercurrent extractor, and regeneration of solvent by evaporation and rectification. The incentive for recovery of chemical values from the extracted pollutants will be investigated.

Principal extraction processes initially under consideration use both a relatively non-volatile polar solvent and a non-polar volatile solvent with the former serving the purpose of removing the majority of the COD content of the wastewater, and the latter serving to remove residual dissolved polar solvent from the treated water.

803 774

Obejctives of the project are (1) to identify elements of activated sludge solids which remove or kill viruses during waste treatment, (2) to improve the technology for recovery and assaying adsorbed viruses and to determine the ultimate disposal of the virus pathogen concentrated by the sludge solids. Approximately 90-99% of viruses in Syracuse, N.Y., waste water were removed by aerobic and anaerobic sludges; 66% of the viruses removed was adsorbed to particulates in the range 1-100 um, 17% by settleable solids. Permanent removal of virions by sludge solids was O_2 dependent and NaCN sensitive. Poliovirus 1 and phage f2 were adsorbed avidly by floc cells of *Zooglea ramigera* (ZR) and by purified, membrane-encolsed polyhydroxybutyrate (PHB) granules. Both are common to sludge. Adsorption kinetics (using 125 I-poliovirus 1 and f2) were similar to removal of viruses by sludge solids. It is proposed that ZR cells and PHB granules will be used as a model system to sutdy both the adsorption of virus particles and factors which can effect their desorption. Special effects will be made to strip away PHB membranes with the attached viruses and to digest the membrane selectively to free the virions; applications of the technique will be applied to sludge assays. The ingestion of adsorbed viruses by ciliates will be studied and their ability to digest or shed viruses will be determined. Uptake of labelled, adsorbed viruses by wild protozoans will be determined.by autoradiography.

803786

Objectives: 1. Study the effects of Sevin, Methyl Parathion, and Malathion singly and in combinations, on respiration, respiratory enzymes, and osmoregulation of *Penaeus duorarum* and *Cyprinodon variegatus*.

Determination of these effects on marine organisms is the main objective.

Approach:

1. Conduct bioassays in continuous flow systems in the laboratory to determine the chronic and acute dosage levels of single and combinations of pesticides.
2. Study the physiological stress as related to oxygen consumption of pink shrimps under constant salinity, and altered salinity conditions. The size of shrimp will be another factor examined.
3. If respiratory stress is detected, then conduct Succinicdehydrogenase enzyme assays on gills of the species.
4. Study the osmotic concentrations of body fluids of shrimp and fish exposed to acute and chronic dosages of single and combinations of pesticides.

Current plans: Awaiting the decision of EPA concerning the funding of this project.

803788

Objective: Demonstrate the feasibility and investigate the durability and economics of the electrolytic process for treating oily wastewater from a manufacturing plant.

Approach: Demulsification is accomplished by passing plant oily wastewater emulsion through permeable iron electrodes.

Current Plans and Progress: During the first year of the program, a one gallon per minute electrolytic unit was constructed and placed in a manufacturing plant and eight batches (about 3000 gal each) of the plant oily wastewater were processed through the unit. The oil content of the processed water generally was below 50 ppm and in several cases below 10 ppm. The second year of the program will include optimization of this system with respect to current and flow rates as a function of plant effluent composition, investigation of the sludge flotation scheme, and a preliminary examination regarding utilization of the oil-rich sludge.

803797

A continuous watershed simulation model will be modified and then tested and verified as a tool to evaluate feedlot runoff control over a wide range of climatic conditions of the United States. Components of the model will include the feedlot surface rainfall-runoff relationship; process generated wastewater, reservoir operations, and disposal component by land application or evaporation.

This model will then be used to develop a more detailed design model to generate design parameters and functions based upon site specific details including climatic conditions, soil characteristics and land availability for disposal.

The model will provide a tool to integrate the various phases of previous current research on feedlot pollution control and disposal of pollutants into a continuous system that will allow evaluation of the degree of pollutant control expected under various conditions.

803 799

The objective of this project is to develop, demonstrate, and use methods and procedures for clarifying the relationship between oxidant precursors (specifically hydrocarbon and oxides of nitrogen) and oxidant (ozone) based on studies of ambient air. Understanding of this relationship is vital to sound development of control strategy, air quality standards, and emission standards. In photochemical smog the major health hazard (ozone) is a secondary product of a very complex reaction of primary pollutants (hydrocarbons and nitric oxide) which are not htemselves highly toxic.

A new gas chromatographic procedure has been divesed which permits direct measurement of ambient concentrations of methane, ethane, ethene, acetylene and total C_3^+ hydorcarbons. This procedure is automated to provide repetitive samples around the clock. These data will be compared with NO_x data and oxidant levels to better define the relationship between oxidant and its precursors, hydrocarbon and nitrogen oxides. The intensive data collection phase of the project is just beginning.

803 802

Atmospheric fates of many of the halogenated compounds proposed here for study are unknown. Significant quantities of these compounds are emitted into the troposphere, and the sources are primarily anthropogenic. Initial investigations indicate that both stratospheric and tropospheric removal mechanisms are operating. The possible stratospheric-ozone destruction by stable halocarbons, the toxicity of phosgene, and the indicated carcinogenicity of vinyl chloride and its structural similarity to other ambient chloroethylenes make continued research urgently needed. It is also imperative to study the unknown long-term effects of halogenated compounds, their reaction products, and the potential utility of halocarbons as tracers of large air masses.

The overall objectives of this three-year research effort are to determine the distribution, sources , and sinks of halogenated compounds and to use halocarbons as tracers of urban pollutants. Our first-year research efforts have led to the discovery of many atmospheric halogenated compounds of natural origin. Ambient halocarbons were measured at a number of urban and background locations with the help of an SRI mobile environmental laboratory. In the second year, attempts will be made to develop highly accurate calibration methods to measure all halocarbons of interest. In addition, new and improved halocarbon measurement techniques will be developed, using specialized instrumentation and improved cryogenic procedures to measure a maximum number of ambient halocarbons. Carefully designed field experiments using the ground-based environmental mobile laboratory and an aircraft will be conducted. Halocarbons will be used to trace the dispersion of urban pollutants in the horizontal and the vertical dimension. Sources and sinks of halocarbons will be determined by an analysis of field and emissions data.

803805

"A Study of Some Important Air Pollutants" - study of removal processes for halocarbon pollutants in the stratosphere and troposphere.

803814

The objective of this study is to determine the rate and extent of reaction of sulfur dioxide and other air pollutants at ppm concentrations with aerosol droplets of the order of size of one micron. In the initial experiments radioactive $^{35}SO_2$ will be transferred to aerosols, and the total radioactive sulfur transferred counted. Models of the mass transfer and reaction will be fit by the experimental data, and used to elucidate the extent of reaction and oxidation to sulfate.

803818

(1) OBJECTIVES - The primary objective of this proposal is the development of methods and techniques to formulate laboratory diets for larval and juvenile marine fish. Such diets are needed in order to achieve high levels of survival and field-comparable growth of laboratory-cultured animals. If successful, the laboratory marine fish will exhibit minimum variability in the lab bioassay due to nutritional stress. Menidia menidia will be used as a test fish.

(2) APPROACH - Test diets will be evaluated for protein availability and storage stability. The nutritional status of field and diet-fed populations will be compared. The life history stages will include eggs, yolk-sac larvae, post-yolk-sac larvae and juveniles.

(3) CURRENT PLANS - Apparent nutritional needs will be determined by qualitative analysis of eggs, yolk-sac larvae, post-yolk-sac larvae and juveniles. The sources of nutrients will be determined by qualitative analysis of laboratory prepared live or artificial food materials. The test diets formulated from qualitative information will then be assessed for protein availability and storage stability using growth studies with the test fish. Finally, the nutritional status of the larvae and juveniles will be compared with field populations using appropriate response parameters: suvival, growth, biochemistry, behavior and stress response.

803820

Objectives:

The project proposes to continue the investigation of the fate and impact of a spill of pentachlorophenol (PCP) in a freshwater lake ecosystem. The primary objectives are: 1) Observe changes in the PCP concentration with time in the water, sediments and organisms, to determine how long PCP poses an environmental hazard and to observe any new influx of PCP from undetected reservoirs; 2) Assess the capability of the freshwater ecosystem to assimilate the acute influx of the persistent, toxic chemical including information on the mode of transport, sites of accumulation, biological magnification, rate of degradation and major degradation products.

Approach:

Samples are being collected quarterly at four sampling sites from the water column (dissolved and particulate PCP), sediments and selected organisms. Analysis will involve extraction into chloroform, methylation with diazomethane and quantitative and qualitative identification with electron capture gas chromatography. Special studies regarding impurities and degradation products of PCP involve the use of GLC, TLC, IR, fluorescence and mass spectrometry.

Pentachlorophenol is a highly toxic chemical with wide application as a wood preservative. Concentrations of PCP have been found in the lake, sediments and fish up to one year after the spill. The proposed investigation will provide information needed to determine the fate and impact of an acute spill of PCP in a natural aquatic environment, over an extended period of time.

R 803826-02-0

THE INFLUENCE ON WATER QUALITY OF INCREASED TEMPERATURES AFFECTING PARTICULATE MATTER IN NATURAL WATERS

This project is a laboratory study to determine the effect of increased temperatures on particle coagulation, concentration, site distribution, and sedimentation rate. Also, the project will determine the effect of increased temperature on the availability of inorganic and organic compounds adsorbed on particles.

803827

OBJECTIVES: DEVELOP AND TEST A SIMULATION TECHNIQUE FOR PREDICTING THE MOVEMENT OF NON-CONSERVATIVE SOLUTES IN SATURATED AND UNSATURATED SOILS.

APPROACH: AN EXISTING DIGITAL COMPUTER, GALERKIN-FINITE ELEMENT, TRANSIENT, TWO-DIMENSIONAL, CROSS-SECTIONAL, SATURATED FLOW, CONSERVATIVE SOLUTE MODEL IS BEING MODIFIED TO DESCRIBE MOVEMENT OF A SINGLE, NON-CONSERVATIVE SOLUTE IN BOTH SATURATED AND UNSATURATED SOILS IN LARGE, THREE-DIMENSIONAL SYSTEMS. THE MODEL WILL BE FIELD TESTED USING CONTAMINANT MONITORING DATA FROM AN EXISTING LANDFILL OR OTHER LAND DISPOSAL SITE.

PROGRESS: (9 MONTHS) SOLUTE MOVEMENT PROBLEMS HAVING EXACT SOLUTIONS WERE SOLVED USING A FINITE DIFFERENCE PROCEDURE AND A GALERKIN FINITE ELEMENT PROCEDURE TO CALCULATE THE DERIVATIVES OF CONCENTRATION AND VELOCITY WITH RESPECT TO DISTANCE AND A THIRD ORDER CORRECT FINITE DIFFERENCE PROCEDURE TO CALCULATE THE TIME DERIVATIVES. FOR THE GALERKIN FINITE ELEMENT PROCEDURE THE FOLLOWING WERE TESTED AS BASIS FUNCTIONS: FIRST AND SECOND ORDER CONTINUOUS HERMITEAN POLYNOMIALS AND ZERO ORDER CONTINUOUS LINEAR, QUADRATIC, AND CUBIC FUNCTIONS. COMPARISON OF THE RESULTS OF THESE VARIOUS CALCULATIONS WITH THE EXACT SOLUTIONS SHOWED THAT THE GALERKIN FINITE ELEMENT PROCEDURE USING FIRST AND SECOND ORDER CONTINUOUS HERMITEAN POLYNOMIALS AS BASIS FUNCTIONS PROVIDED THE MOST SATISFACTORY COMBINATION OF ACCURACY AND COMPUTATIONAL EFFICIENCY, PARTICULARLY FOR LARGER VALUES OF THE TIME STEP, NODE SPACING, AND DISPERSION COEFFICIENT. BECAUSE THE FIRST DERIVATIVES OF HERMITEAN POLYNOMIALS ARE CONTINUOUS AT ELEMENT BOUNDARIES, USE OF THESE POLYNOMIALS ALLOWS CALCULATION OF A CONTINUOUS FLOW FIELD AND HELPS TO MINIMIZE SOLUTE MASS BALANCE ERRORS WHICH MAY OCCUR WITH OTHER METHODS. FUTURE WORK WILL MODIFY THE MODEL TO ACCOUNT FOR ADSORPTION/DECAY OF SINGLE, NON-CONSERVATIVE SOLUTES AND WILL TEST THE MODEL WITH DATA FROM AN EXISTING LANDFILL.

803831

Evaluate the utility of full scale application of various treatment processes that proved effective during field scale studies. Several processes will be checked independently and in combination. Research will be conducted on ozone as an alternate disinfectant to chlorine.

803835

The research will investigate the accumulation, degradation, and effects of atrazine on a series of model ecosystems consisting of organisms from a salt marsh. Initially, the effects and fate of atrazine applied to the primary autotroph of a Georgia salt marsh, Spartina alterniflora, rooted in washed sand in sea water, will be studied. When that phase of the research has been completed other organisms will be added, one at a time, and the effects of atrazine and atrazine metabolites on these additional components of the system will be established. The organisms to be added represent different trophic levels and pathways in the food web and will be selected from among; Sesarma reticulata, Palaeomonetes vulgaris, Uca pugnax, Modiolus demissus, and Fundulus grandis. The data obtained from the model systems will be compared with data obtained for similar species harvested from atrazine-treated plots layed out in the Sapelo Island salt marsh.

A separate but related study will be made of the effects of atrazine on diatoms present in the salt marsh. This will include measuring the effects of different concentrations of atrazine on the growth and carbon fixation by pure cultures of the two or three of the most important diatom species in the marsh and and monitoring population shifts in the marsh after atrazine treatment.

803 838

The purpose of the proposed research would be threefold: (1) to determine how sublethal levels of juvenile hormone mimics and insect growth regulators may affect survival of developing invertebrate larvae, from hatching to the juvenile stages, the way in which these compounds may alter the length of larval development under laboratory culture conditions, and how the effect of these compounds may be diminished or accentuated by stress conditions of the environment; (2) the way in which sublethal levels of these compounds may affect behavior of larval stages, initially determined experimentally by measurement of swimming speeds and directional orientation to a light stimulus (phototaxis); and (3) the way in which sublethal levels of these compounds may produce long-term mutogenic effects on small marine copepods which can be maintained under laboratory culture for up to 45 generations.

803839

The aim of this project is to study the effect of chlorination of estuarine water on organic matter in the water, and particularly to study the generation of organic halogen compounds during degradation of chlorine produced oxidants. The specific research objectives are the following:

1. Identify and quantify the halogenated organic compounds produced during passage of water down the power plant's long cooling canal.
2. Determine chemical factors controlling yields of the various compounds by studying the cooling waters under a full range of ambient conditions.

803844

1. Objectives: The overall objective of this study is to evaluate the survival and transport of enteric viruses at land application sites for wastewater following conventional wastewater treatment. Specific, detailed objectives are: (a) to determine the survival of enteroviruses distributed to the soil following wastewater irrigation; (b) to follow the movement of indigenous enteroviruses and bacteriophages specific to *E. coli* through the unsaturated soil zone via lysimeters; (c) to ascertain possible movement of indigenous enteroviruses and bacteriophages in the groundwater beneath a wastewater land application site by sampling monitoring wells; (d) to conduct a mass balance of indigenous enteroviruses entering and leaving the site; (e) and to initiate the study of the presence in wastewater of specific bacterial pathogens and to ascertain their possible presence in soils and lysimeter and monitoring well waters.

2. Approach: Several sites would be evaluated as potential study sites. It was planned to characterize the treatment facilities, soils, irrigation systems, and streams at the sites. Analyses would be conducted for chemical, physical and biological parameters. Methods would be developed to adequately process all types of samples encountered. The unsaturated soil zone percolate would be evaluated for virus transport by lysimeters; the saturated zone by monitoring wells.

3. Progress: Two sites have been selected for study. One of the sites was selected for intense study due to the fact that it has a range of soil types and wastewater irrigation history. Its wastewater treatment and spray irrigation systems are new. Thus, 9 lysimeters to depths of 4.5 ft. and 6 monitoring wells have been installed. Background sampling and treatment plant characterization has been completed. Sampling and sample processing methodology has been modified to facilitate handling of the samples obtained from both sites and to optimize virus recovery.

803849

Objectives:

(a) Study the migration and degradation of the pesticides Methyl Parathion, 2,4-D, Atrazine, Trifluralin, and Terbacil in soils which have received high concentrations of these pesticides.

(b) Test the applicability of exssting mathematical models in describing migration and degradation of high concentrations of pesticides.

Approach: Laboratory studies of pesticide adsorption, degradation, and leaching in five different soils.

Progress: (9 months)

(a) Over the concentration range 0-5000 mg/ml the isotherm for adsorption of 2,4-D on Webster silty clay loam soil (Typic Haplaquoll) may be described by the Freundlich equation with an exponent of 0.71; previous work at lower concentrations had estimated the exponent to be near unity.

(b) Assuming a linear adsorption isotherm (Freundlich exponent = 1.0) results in substantial error when mathematical models are used to predict movement of high concentrations of 2,4-D in soil.

(c) An organism capable of utilizing 2,4-D as its only carbon source has been isolated from the Webster soil.

(d) After measuring both gross CO_2 evolution and evolution of ^{14}C-labeled CO_2, it has been concluded that measuring only gross (unlabeled) CO_2 gives a substantially inaccurate estimate of 2,4-D degradation in soil.

803 851

Aerosol size distributions have been measured in the St. Louis area as part of EPA;s Project MISST using aircraft and ground based self contained mobile laboratories. These measurements were made with a group of collaborators such that a complete array of chemical, physical, and meteorological measurements were obtained on a coal fired power plant plume. The University of Minnesota's portion of the project included aerosol measurements aboard an aircraft and the operation of a mobile van on the ground under the plumes.

This mobile van was also operated on freeways in the Los Angeles area during October 1976 as part of an EPA sponsored project to study sulfur aerosols on roadways.

Much of the work during the next project year will be analysis and reporting of the large amount of data obtained during the past several years. Analysis is being directed toward obtaining aerosol growth rates in the plumes, aerosol nucleation rates in the plumes and surrounding atmosphere, and toward better descriptions of the aerosol size distributions. Laboratory work toward the development of a continuous instrument for the measurement of aerosol sulfur is also being partially supported by this project.

803859

"Ecosystem Responses to Alternative Pesticides in the Environment: A Systems Approach" The general objective of the project, directly addressed during the second budget period, is the development of models to assist in evaluating effects of pesticides on various ecosystems.

803868

The development of infrared Fourier Transform spectroscopic techniques to characterize certain key air pollutants, their precursors and reaction products and to establish quantitative kinetic and mechanistic details of the interrelationships between these pollutants both in simulated and real atmospheres is the primary objective of this proposed work.

In particular, FTS techniques will be used to obtain long path length atmospheric spectra to aid in the identification of trace atmospheric constituents, to study some aspects of the natural removal mechanisms of Freons from the atmosphere and of their influence on atmospheric ozone, and to study some key reactions of importance in photochemical smog formation.

803870

Biomanipulation-An Ecosystem Approach to Lake Restoration. An investigation of the manipulation of the biota of lakes as an approach to lake restoration.

803872

The objectives of the research are to define effects of continuous exposure to chlorine on larval development, juvenile growth, and reproductive parameters, for two selected marine decapod crustaceans, *Panopeus herbstii* and *Pagurus longicarpus*. Additionally the effects of chlorine on development of the coot clam, *Mulinia lateralis*, and blood serum constituents of the blue crab *Callinectes sapidus* will be studied. Preliminary data suggest that responses occur only at chlorine doses dose to the lethal concentration. Reliable test systems developed to date will be used to define chlorine effects.

803887

"Mesoscale Sulfur Balance Studies" - This grant supports a comprehensive study to determine the concentration of sulfur in aerosol particles at 10 or more sampling stations located between the mid-continent and the eastern seaboard of the continental USA and a number of remote stations in marine and continental areas.

803892

The objective of the project is to determine the efficiency of the rotating biological contactor (RBC) system in treating effluent from a liquid detergent manufacturing plant. Efficiency will be compared to an extended aeration system now in operation and advantages and disadvantages of the experimental system identified.

A pilot unit will be operated with the same feed as the existing plant and performance under various conditions will be determined. Variables to be evaluated include performance at optimum conditions compared to extended aeration, maximum loadings to the system, performance under variable loadings, performance at wastewater temperatures experienced both during the summer and winter.

The project is expected to be completed within twelve months of initiation.

803893

The objective of this grant will be to identify the halogenated organic compounds that are formed when chlorine is added to seawater, in conformance with the original grant application. The primary research strategy will be to chlorinate seawater under different conditions of temperature, sunlight and organic content and isolate the products.

R 803896-01-5

SULFUR BUDGET IN LARGE PLUMES
The objective of this program is the determination of the fate of anthropogenic SO_2, i.e., the rate of sulfate formation and the rate of removal of SO_2 to the ground. During this budget period, individual power plant plumes, urban plumes, and plumes from power plant complexes will be studied.

R 803897-02-0

PLUME OPACITY RELATED TO PARTICLE SIZE AND CHEMICAL COMPOSITION
The objective of this proposal is to study the relationship between the in-stack opacity and the physical and chemical properties of the particulates in the emissions of a variety of stationary pollution sources. A 3-year effort is proposed with the first year effort mostly concerned with the development of methodology and procedures while studying the emissions from a small coal-fired heating plant boiler. Three additional sources will be studied during each of the following 2 years.

803902

1. Objectives:
   - (a) To develop a facility and methodology for interdisciplinary experimental studies of coastal marine ecosystems.
   - (b) To carry out basic scientific studies on coastal marine ecosystems and their response to perturbations
   - (c) To measure the responses of coastal ecosystems and their component parts to controlled pollution stresses likely to be associated with the development and implementation of national energy policy
2. Approach:
   - (a) Large replicate (~5m dia. x 10m deep) experimental water columns, including benthos and sediments, will be established in the lower West Passage of Narragansett Bay. Some of the columns will be run as open systems, while others will be run as batch systems for several months at a time.
   - (b) Stresses such as petroleum hydrocarbons, metals, biocides, etc. will be added to the system at low, controlled levels.
   - (c) Additional experimental systems with seagrass, Zostera marina, may also be studied.
3. Current Plans:

   The first series of experiments will study the effects of petroleum hydrocarbons on the species structure, population dynamics, energy flow, nutrient dynamics, and biogeochemical cycles of coastal marine waters and sediments.

803 903

Program Objectives: This research grant application renewal, prepared by the City of Ames and its sub-contractors, is for a second year continuation of a three-year program to conduct an in-depth evaluation of the environemntal, economic, and technical aspects of a full-scale on-line solid waste recovery system. This system is producing refuse-derived-fuel to supplement firing in coal-fired steam generators and is providing for valuable metal recovery. The program has the following principal objectives: (1) Technical, economic and environmental evaluation of the facilities and equipment, individually and as a system, including both the processing plant and associated power plant operations; (2) Characterization of the refuse fuel and hyproduct materials produced by the system; (3) Determination of the environmental impact of firing MSW as a supplementary fuel in a utility boiler, including air, water and solids effects. Laboratory analysis and measurement instrumentation is being conducted by E.R.D.A. Ames Laboratory (Iowa State University) personnel.

803 915

The objectives of this project are to determine the concentration of polychlorobiphenyls (PCB) in the atmosphere and precipitation in Chicago and their distribution in the Lake Michigan basin. The washout coefficient for PCB by precipitation will be determined and this, along with the above information will permit the inputs of these materials in precipitation to Lake Michigan to be determined. The distribution of the PCB in the atmosphere between vapor and material adsorbed on aerosols will be determined. Information on other chlorinated hydrocarbons should also be determined.

803918

1. Objectives: To determine by epidemiologic and supportive laboratory studies the health effects of consuming barium in Illinois drinking water exceeding wthe recommended drinking water standard of 1.0 mg/liter. Particular emphasis will be given to see if barium consumption is associated with cardiovascular and renal disease and the prevalence of hypertension. 2. Approach: (a) Mortality rates will be retrospectively examined for statistical differences between deaths attributed to cardiovascular diseases in communities in Illinois with elevated barium levels in their drinking water supplies and the National and State averages. Diseases examined will include hypertension, ischemic heart disease, peripheral vascular disease, cerebrovascular disease and renal disease. (b) A household morbidity study will be performed on an exposed population. Morbidity rates will be compared with the National and State averages. The exposed population will be subjected to blood pressure measurements and a questionnaire Tap water samples from households will be analyzed for trace metal composition. 3. Progress: We have identified those Illinois communities above the standard of 1.0 mg/liter We have acquired Illinois State Death Certificate Tapes from which mortality rates will be examined. We have made initial contact with the communities involved in the morbidity study.

803922

A study of the chemical and biological effects of chronic low-level petroleum input to the intertidal environment by oil seeps will be conducted. Chemical measurements of the kinds and amounts of hydrocarbons in water, sediment and selected biota of seep and control areas will be made. Biological measurements of the fitness of selected species and communities in oiled and unoiled sites will also be made. Biological measurements will focus on phytoplankton because of their key position in food webs and on sessile benthic infauna and epifauna because of their exposure for multi-year periods. Field will be conducted at an oil seep impacted area at Oil Bay, Alaska in lower Cook Inlet. This will be supplimented by controlled experiments conducted at Seward, Alaska.

803932

Objectives of this project are:

1) to quantify the effects of coal leachate on species composition and structure of periphyton communities
2) to identify leachate components with inhibitory or stimulatory effects
3) to elucidate possible synergistic or antagonistic interactions among leachate components

Approach:

Periphyton communities are grown in laboratory streams on artificial substrates. The bioassay facility utilizes water from Lake Superior and is located at the EPA's National Environmental Research Laboratory in Duluth, Minnesota. In experiments which last from 3 to 8 weeks, periphyton communities are dosed with various concentrations of coal leachate, coal distillate, or fractions thereof, and growth response is measured as changes in biomass (chlorophyll and ash-free dry weight). Algal communities are also examined microscopically to detect changes in species composition and diversity.

Current plans and progress:

Coal leachate appears to stimulate the growth of algae. Current efforts are focusing on identifying the specific chemical factors responsible for this effect.

803 945
The effects of a buried pipeline stream crossing are being monitored in the Chatanika River near Fairbanks to determine the environmental effects of bottom disturbance. Parameters being considered are 1) Type and rate of flow; 2) Oxygen and carbon dioxide content of water; 3) Water Temperature; 4) Size, type and distribution of particles forming the stream bottom; 5) Intra-gravel water flow and chemistry; 6) Quantity and diversity of animal and plant organisms; 7) organic drift; 8) Primary productivity.

Because of better access and an apparently greater diversity in the biota, the study site was changed from the Salcha River to the Chatanika River. Except for organic drift (7) and primary productivity (8), preliminary monitorings have been accomplished. Factors 7 and 8 still await the arrival of apparatus. Post-construction monitoring will begin as soon as the pipeline is installed. Factors 7 and 8 will be monitored upstream and downstream from the crossing.

803950

The overall objective of this investigation is to provide predictive information with regard to potential toxicants in the aquatic environment resulting from coal and oil shale extraction and conversion. The specific objectives are to identify and quantify those chemical products of coal and oil shale extraction and conversion which may reach surface waters, and to determine by both field studies and laboratory bioassays the degree to which those chemicals may be acutely or chronically toxic to fish and aquatic invertebrates, or may become involved as part of the food chain. Four categories of energy development will be considered: coal extraction, oil shale extraction and processing, coal gasification, and coal-to-energy conversion. Potential toxicants to the aquatic environment are being identified by a combination of field, laboratory, and literature studies, as well as by information gained from cooperative input from other energy-related research programs. Concurrent chemical and biological laboratory and field bioassays as well as aquatic distribution studies dictate which toxicants are most deleterious to the aquatic biota. Feedback from these bioassays and distribution studies dictate what additional or alternate emphasis is required in the laboratory and field chemical studies.

803952

A major thrust of this project will remain the monitoring of polynuclear aromatic hydrocarbons (PAH's) at the micropollutant level (ppm or less). The high pressure liquid chromatography-gas chromatography (HPLC-GC) identification methodology developed in these laboratories for the analysis of trace PAH's in coal leachates, and in general water samples, will be extended and applied to such problems as the bioconcentration of PAH's in fish tissue, aiding in the analysis of "second-order" PAH's (i.e., metabolities, photochemical oxidation products, aqueous disinfection products), and in the PAH analysis of coal steam distillates. The ultimate goal of the proposed investigation is to determine the long range influence of a coal loading facility on a Great Lake Harbor in terms of transport of coal particulate matter, using physical and chemical measurements and application of numerical modeling for water quality to the Duluth-Superior Harbor.

803 965

1. Objectives: Part A. To investigate the mode of action of pesticidal substituted N-phenylformamidines in mammals, particularly chlordimeform (N'-(4-chloro-*o*-tolyl)-N,N-dimethylformamidine, Galecron^R, Fundal^R). Furthermore to develop a therapeutic regimen for their toxicity, and to evaluate possible interactions due to their properties as monoamine oxidase inhibitors (MAOI) or to their metabolism by microsomal mixed function oxidases. Part B. To investigate the scope and significance of glutathione transferases in the mammaliam metabolism of the major pesticide groups.

2. Approach: Relevant to Objective A, neurological, cardiovascular and respiratory functions will be monitored during poisoning in cats to establish symptoms and cause of death. Further studies in vivo and invitro will attempt to define the site of action and need for metabolic activation of chlordimeform. Its properties as a MAIO will be defined and the potential for cumulative toxicity and interactions with some drugs and dietary amines studied. Strategies for therapy will be developed from the above studies and by screening candidate drugs in mice.

Relevant to Objective B, a survey of common pesticides as potential substrates for glutathione transferases in rat and human liver subfractions is planned. Further studies in vivo will be made, where glutathione transferase action seems important, to assess the toxicological significance of this system.

3. Current Plans/Progress: Several aspects of this study are a continuation of work already in progress e.g. studies of the toxicology of chlordimeform in the cat, and evaluation of the possibility that chlordimeform undergoes activation in vivo. The studies of the role of glutathione transferase in pesticide metabolism are an expansion of similar studies in progress with organophosphorus insecticides (e.g. see Hollingowrth et al., Life Sci. (II) 11, 1181-1190 (1973)).

803971

This proposal is for continuation for the second year of a research project to investigate the environmental changes due to construction and operation of a two-unit coal-fired power generating station. Originally research was commenced in 1971 under a grant from three Wisconsin power companies. The site is on the flood plain of the Wisconsin River near Portage, Wisconsin. Primary attention is given to the impact on the aquatic environment. A portion of the study considers, in concert with staff of the Wisconsin Public Service Commission, criteria for the siting of power generating stations. Approach is multi-disciplinary, with discrete sections focused on: aquatic invertebrates and fish, hydrogeology, plant damage, air pollution modeling, visual changes, wetlands ecology, meteorology, remote sensing, trace elements, aquatic chemistry, organic contaminants, dual purpose generating stations, transmission lines, energy supply options, and methodology of siting.

803977

The proposed investigation is intended to analyze selected treated and untreated waters for the presence of polynuclear aromatic hydrocarbons (PAH). The trace quantities of PAH from water will be concentrated using flexible polyurethane foam columns, a technique which was developed in the first phase of the project. The problem will be divided into two segments. The first segment will be devoted to local field testing of the methodology and determination of PAH in drinking waters of Syracuse and vicinity. The second segment will be devoted to analysis of finished drinking water supplies in the Northeastern region representing various categories of raw water sources. Selected natural water samples containing varying degrees of pollution (in the vicinity of coke oven plants and petrochemical complex) will also be analyzed for PAH.

The purification of PAH will be achieved by chromatography on alumina and/or florisil. The eluate from column chromatographic separation will be analyzed by gas chromatography, and thin-layer chromatography/fluorescence scanning. The identification of isolated material will be based on their G.C. retention times or volumes, TLC Rf values, and ultraviolet and fluorescence spectra. Mass spectrometry will be used to provide final evidence of their identity.

The qualitative and quantitative determination of the levels of polynuclear hydrocarbons in drinking waters will provide the needed information for setting up intelligent water quality standards for PAH and thus minimize health hazards to the public.

803983

1. Objectives: To describe how a particular, semi-tropical estuary and coral-reef complex responds to the "relaxation" of sewage stress; to arrive at useful generalizations therefrom.

2. Approach: Time series baseline data on chemistry, plankton, benthos before and after sewage relaxation; field and laboratory experiments to answer specific questions.

3. Progress: Field work has been underway since January 1976, and time-series trends are being defined at selected locations. Experiments or measurements of productivity, nutrient regeneration, feeding behavior under way or planned. We will continue the routine field sampling and experimental efforts. The outfall diversion data (the "before-after" boundary) will occur during the upcoming fiscal year.

804102

[illegible] investigators [illegible] these purposes.

The overall objective of this project is the modification, calibration and verification of mathematical models that use input information (e.g. nutrient, pesticide, and soil properties; management practices; watershed characteristics; and climatic factors) and predict concentrations and losses of nutrient and pesticides in surface runoff. Over a thirty month period, numerous samples of surface runoff will be collected and nutrient (nitrogen and phosphorus) and pesticide concentrations in both the sediment and water fractions will be determined. Soil profiles of watersheds (~20 acres) in corn and soybeans (fertilized and treated with pesticides) and in grass (fertilized 2 out of 3 years) will be sampled periodically and the samples analyzed for nutrients and pesticides to provide source data. In the case of pesticides this data will be used to calibrate and verify the pesticide transport and runoff model (PTR) already developed. The data for nutrients will be used to develop, calibrate and verify the companion nutrient transport and runoff model. Sediment transport models will be developed and tested as a part of the transport system.

In addition, flow, sediment, nutrient, and pesticide levels will be monitored at a stream controlling a 19.5 mi^2 watershed which includes the three field-size watersheds of interest. Four intra-basin stations upstream from the main station will also be located and monitored during selected runoff events. This data along with inventory data of farm management practices within the large watershed will be used to evaluate the effect of overland flow and channel processes on the transport of agricultural chemicals.

As of April, 1976 the field installations are nearly complete. Flow measurements and sampling were initiated between January 1 and April 15. The intra-basin stations will be completed in May.

804 123
Catalytic hydrodesulfurization (HDS) and hydrodenitrogenation (HDN) reactions for the removal of organic sulfur and nitrogen compounds from liquid fuels are becoming increasingly important as strict sulfur and nitrogen oxide emission standards are set, and "dirtier" oils derived from shale and coal attain wider use.

A quantitative description of the interferences between these two reactions, which have only recently gegun to be studied, is necessary for optimal design of commercial processing units. To date, we have studied thiophene and pyridine as representative sulfur and nitrogen compounds in a continuous-flow microreactor to model basic interactions. Pyridine inhibits thiophene HDS under all experimental conditions used. Sulfur compounds exhibit a dual effect on the HDN of pyridine; a reaction rate inhibition gives way to an enhancement at more severe reaction conditions. Theoretical considerations have been presented to account for each of these effects. Reactions of more complex compounds and their interactive reaction kinetics are currently under investigation

804152

This project is an investigation of the potential effects of an oil spill on a large arctic lake. The principal effort of the proposed research will be to carry out an experimental spill and to observe the impact and recovery. Initially a pre-spill baseline study will be done on the proposed site. Controlled small-scale laboratory and field experiments also will be carried out on specific organisms or processes as part of the initial work. Emphasis will be on the analysis of ecosystem function in order to broaden the applicability of these results to other high latitude aquatic environments.

The program is to be coordinated closely with energy-related impact studies sponsored by ERDA and with basic aquatic studies sponsored by the NSF Office of Polar Programs.

804168

Assessment and correlational analyses of biochemical, nutritional, and growth parameters with the amount of exposure of commonly accepted sources of environmental lead (air, dust, and water) are being performed sequentially throughout the mother's pregnancy and the subsequent offsprings first two years of life to determine the relative effect of multiple sources of lead exposure on the mother and child and the longitudinal changes in blood lead concentrations and body burden of lead in the growing infant and child. Approximately 200 to 250 women in each of three cities, Columbus, Ohio; Boston, Massachusetts; and New Bedford, Massachusetts; are being enrolled early in the second trimester of their pregnancies. Differences in sociological and environmental aspects which may contribute to undue body lead burden from city to city should be elucidated. Initial data on approximately 150 pregnant women and on approximately 10 of their offspring indicate a very direct correlation between lead in blood in the mother, cord blood lead determinations, and newborn infant lead values. There also appears to be a significant difference in the values determined in the populations of the different cities. Observations on environmental aspects show a remarkably constant figure for lead in air in all cities, and lead in dust results confirm dust to be a significant source of lead intake for children.

804190

A program is proposed which consists of two parallel efforts: (1) continuation of studies on the characterization of aerosol fractionation with a centripeter and (2) development of the technology for use of the centripeter in the collection of submicron particulate matter.

With respect to accomplishments during the first year of the Grant, a new sampler inlet has been developed which is compatible with the EPA Dichotomous Sampler. The device has a 50 percent cut point of 18μm and is insensitive to wind speed and directional effects. In addition, design criteria have been developed for the centripeter fractionation concept. For conditions under which the ratio of spacing between acceleration nozzle and collection nozzle is 0.8, the ratio of collection nozzle size to acceleration nozzle size is 1.4, the Reynolds number of the acceleration nozzle flow is 5000, the effective stokes number (value of the Stokes number for which the efficiency is 50 percent) is 0.26.

804204

The overall objectives of this research project are to (1) standardize a mutagen screening system (Ames Back Mutation Test) which is sensitive and has a high degree of reproducibility, (2) utilize this system to identify the mutagenic character of chemical contaminants in water and (3) develop a forward mutagenesis screening system to be used in conjunction with the back mutagenesis system. Specifically, we are currently testing known chemicals present in New Orleans drinking water supplies, as well as testing bulk drinking water in the metropolitan Atlanta area. One feature of our results dictates the need for another test sytem for chemicals that prove too toxic for testing in the Ames system. Therefore, some chemicals are being evaluated by their ability to produce single stranded breaks in DNA.

804 205

(1) The development of biological controls that can operate within an integrated control framework.

(2)a. Survey for potential targets for biological control of urban pest insects in the United States. b. Explore for natural enemies of particular urban pest insects: Pyrrhalta luteola, the elm leaf beetle; Illinoia liriodendri, the tulip tree aphid; Hyphantria cunea, the fall webworm. c. Evaluate successfully introduced parasites: Trioxys curvicaudus on the linden aphid: Eucallipterus tiliae; Trioxys hortorum on the elm aphid: Tinocallis platani.

(3) Currently we operate integrated control programs for five cities and one school district. The emphasis in this project is to further develop, document and plan to extend the biological control of urban pest insects.

804215

The goal of the program is to assess the US coastal waters for the support of marine resources such as food from the sea, the vitality of communities of marine organisms and the continued use of non-living resources such as beaches and harbors, and the prediction of future exposure levels of pollutants based upon the best existing information and models.

804236

I. Objectives:

The objective of this proposed project is to improve the overall quality of Little Muskego Lake located in the southeast corner of Waukesha County on the southeast edge of the Milwaukee metropolitan area. In 1974 the city acquired the 7-acre Idle Isle within the lake to be developed as a park for public access and recreation. The immediate Milwaukee area residents use the lake for recreational purposes. The lake, partially surrounded by the town of Muskego, has a 506-acre surface area with a mean depth of only 14 feet. It is, in part, an artificial lake formed by damming the outlet in 1938, and it now covers an extensive area of overflooded lands supporting a continuous summer growth of macrophytes which reach a depth of 12 feet. Over the decades decaying plants have led to a buildup of nutrient rich sediments which now contribute substantially to continued macrophyte growth and decreasing depths in the lake. A major source of nutrients to the lake was eliminated in 1974 when a central sewerage system around the lake was completed and put on line. Also, construction of a sewerage collection system around Linnie Lac, a major water and nutrient source to Little Muskego Lake, is now being negotiated. These actions for nutrient control were initiated in response to a 1969 recommendation by the State Department of Natural Resources. DNR recommended that enrichment of the lake should be controlled prior to major restoration activities. Since nutrient control measures are now in the process of being installed, the applicant proposes to dredge 2.25 million cubic yards from the lake to remove the existing organic rich bottom material along with the macrophytes, and correspondingly deepen the lake.

II. Reviews:

This grant application was reviewed by a "Clean Lakes" panel consisting of Regional representatives and Headquarters personnel. The extramural reviewers were:

David G. Frey, Indiana University
Patrick L. Brezonik, University of Florida

804256

The basic structure of this experimental design is to examine the effects of air pollution on various cardiopulmonary parameters. The design will involve both longitudinal and cross-sectional applications and include a number of age groups.

Three geographic locations will be selected and include: 1.) an area of heavy population, 2.) an area of intermediate or varying population, 3.) a clean area. In each of the areas a minimum of 150 volunteers within each age group will be tested. The various tests which will be conducted and other data collected include: 1.) vital data, 2.) pulmonary function testing, 3.) maximal expiratory flow volume curves, 4.) multiple-load exercise test, 5.) alpha-1-antitrypsin, 6.) methemoglobin, 7.) carboxyhemoglobin, 8.) mercury and cadmium in blood, 9.) mercury and arsenic in urine, 10.) tracemetals in hair, 11.) questionnaire completion Aerometric monitoring will be carried out at multiple sites within each of the three areas and will include: 1.) total suspended particulate, 2.) SO_2, 3.) NO_x, 4.) hydrocarbons, 5.) ozone, 6.) trace metals, 7.) meterological data.

The data collected will be analyzed among and between the age groups using multiple linear regression and analysis of variance models.

804265

An international conference will be held under the auspices of the Subcommission on Salt-Affected Soils of the International Society of Soil Science. The conference will be hosted by Texas Tech University and co-sponsored by New Mexico State University, Texas A&M University, the U.S. Salinity Laboratory, and the U.S. Environmental Protection Agency. There will be five days of paper presentations and workshops (August 16-20, 1976) and a four-day field trip through West Texas and southern New Mexico (August 21-24, 1976).

The objectives of the conference are(1) to exchange results of research on field use of saline waters for irrigation,(2) to compare prediction models for salinity control in irrigation return flows,(3) to exchange data on field testing of prediction models,(4) to obtain agreement on standardization of analytical methods for soil salinity tests, and (5) to encourage national and international cooperation in resolving salinity problems.

804 270

Objectives of project

Electrical mobility analyzers are being used with increasing frequency to determine the size distribution of the atmospheric aerosol. In particular, the Whitby electrical mobility aerosol analyzer has been used in the United States in several recent extensive air pollution field studies sponsored by the UNS. Environmental Protection Agency as well as by various state agencies.

However, up to the present time, there has been no independent effort at testing or calibrating the Whitby analyzer whose primary calibration has been based on aerosols generated in the laboratory having composition and size distribution differing importantly from those typical of atmospheric aerosols.

In view of the ever increasing use of electrical mobility analyzers in laboratory and atmospheric aerosol studies, it is believed to be essential to obtain independent measurement and calibrations of such devices.

We wish to propose an independent investigation, of the measurement of the atmospheric aerosol with the Whitby aerosol analyzer using the diffusion battery facility and toher aerosol measurement facilities of the Centre d'Etudes Nucleaires de FONTENAY AUX ROSES, France.

804286

The objective of this project is to evaluate the safety for human consumption of poultry slaughtered and processed with an average 50 percent mixture of treated well-water and reclaimed wastewater from the same plant. The wastewater reclamation system has been constructed and a preliminary study has indicated that the renovated water is capable of meeting the 1962 P.H.S. Drinking Water Standards. The purpose of this project is to evaluate with actual recycle the safety of the renovated water and the processed poultry, both in terms of the new E.P.A. primary drinking water regulations, as well as any other chemical and microbiological contaminants likely to be present and have an adverse effect on human health.

After the renovation system has been optimized (Phase 1), a two-month study (Phase 2)will be instituted, without actual return of water to the treatment plant, following which an evaluation will be made with representatives of the Department of Agriculture and the E.P.A. as to the quality of the renovated water and the contaminants in the carcasses processed with well water and renovated water. If the evaluation indicates that there is no danger to human health, Phase 3 will be instituted in which for a three month period there will recycle of the renovated water through the processing plant. The water and processed poultry will be studied as in Phase 2. Following the termination of Phase 3, an evaluation will be made of the health implications of continuing processing the poultry with the mixture of treated wastewater and well-water, as well as the need for monitoring to insure the safety of the system and the protection of human health.

804288

The objective of this project is to prepare for the U. S. Environmental Protection Agency an intensive analysis of developments related to research in water pollution control arising from the Eighth International Conference on Water Pollution Research. The Conference, which is sponsored by the International Association on Water Pollution Research, will be held in Sydney, Australia on October 17-22, 1976. The U. S. A. National Committee is sponsored by five major professional societies in the United States and is the body in the United States representing the United States in the IAWPR.

804323

This study is concerned with determining if heavy metal contaminated soils can be reclaimed for vegetation purposes by treating with sewage effluent and waste. A general survey of the polluted area will be made. Plots will be established on the site in question. Each plot will be treated with different amounts of sewage effluent and waste. Comparison with a control will allow a determination of how successful each treated plot was in attempting to reclaim the soil.

804329

Objective - to evaluate the treatment efficiency of technological processes defined by EPA as BATEA for the textile industry and to evaluate the economic achievability and impact on the industry resulting from the application of these technologies.
Approach - the project will consist of two phases, (1) engineering field studies and (2) economic evaluation.
Phase 1 - to be conducted by a mutually agreed upon consultant engaged prior to the development of the testing program. Two mobile pilot treatment units will be designed, constructed and, in total, be operated at approximately 24 manufacturing plant sites over the study period. Each plant site will be selected from BPT class plants to represent as completely as possible, all the EPA textile plant subcategories. The treatment processes to be tested by the mobile pilot plants will include chemical treatment (including carbon adsorption), multi-media filtration, chemical coagulation/ clarification (or equivalent) and other mutually acceptable processes if they can be accomplished within the scope, funding and context of the project.
Phase 2 - Process treatment data from phase 1 will be used to evaluate the economic achievability and impact upon each segment of the industry resulting from the application of the technologies tested in phase 1. This phase will be conducted by a mutually acceptable specialist in the field of economics.
Current Plans - the project will be under the general direction of the Environmental Preservation Committee of ATMI with a day-to-day monitoring by the Water Subcommittee. The Effluent Guidelines Division and the Office of Research and Development of EPA will be requested to cooperate in the project and to assign personnel to meet with ATMI representatives in formulating and monitoring the project.

804 331

Grumman willcconduct a twelve (12) month study to investigate the viability of utilizing, on a production basis, the new reduced-pollution, corrosion-protection paint systems in lieu of the currently used organic paint systems and cyanide plating solution.

804335

The objective of this research project is to devise a means for introducing intrinsically involatile compounds into the ion source of a suitably modified mass spectrometer. Achieving this goal will permit the identification of molecules separated by such techniques as dense gas chromatography and/or high pressure liquid chromatography by mass spectrometry. A major challenge facing analytical chemistry today is the development of a sensitive, compound-specific detector for these fractionation methods. The ability of a high pressure liquid chromatograph to separate complex mixtures of compounds not amenably to gas chromatography is well known. The "dense gas chromatograph" the carrier is a gas at a temperature above its critical temperature and a pressure such that it has solvent properties analogous to those of a liquid, although relatively untried, has some advantages over the LC, particularly in regard to coupling to a mass spectrometer. Both will be tested. Several novel concepts for stripping solvent molecules from the species of interest without decomposing them thermally or contacting them with surfaces require empirical testing to establish the best means for transport from the high pressure regions into the high vacuum of the mass spectrometer. All involve multi-stage molecular beam techniques in combination with some means of controlled heat transfer during the expansion step which creates a supersonic jet.

804338

This proposal requests funds for continuation of previous studies relating to toxic pollutants in the New York Bight. More strictly it is a renewal grant proposal for a different approach, i.e. microbilolgical assays (Ames Technique) for montiroing extracts of polluted sediments to determine if they induce mutations in selected indicator strains of Salmonella typhimurium. These assays may be adapted with a high degree of reliability to detect chemicals which are potential human carcinogens by the addition of mammalian liver homogenates to the test plates. Preliminary tests on sediment from EPA station 44 are promising, but more intense effort and training will be required as follows:

1. To optimize methods of extraction of mutagens from sediment and water.
2. To adapt mutagen assay to testing of sediment and overlying water.
3. To study application of mammalian liver fractions to this assay to correlate mutagenic and carcinogenic effects of sediment extracts.

A traingin period will be required to set up base line dats for recovery of known mutagens and carcinogens added to sediments as controls.

For details seememo called Background for Study of Mutagenic Effects of Pollutants in Sediments from N.Y. Bight.

804367

The purpose of this program is to investigate on a pilot scale the effectiveness of Ultrafiltration (UF) and Carbon Adsorption for the treatment of industrial laundering wastewaters. A field demonstration system with a nominal capacity of 5000 gpd will be operated for a four-month period on actual laundering effluent. The system will utilize full-size spiral wound ultrafiltration membrane modules. The UF permeate will be further tested by passage through a 2" diameter carbon column. The project will establish the UF/Carbon adsorption system's economics, efficiency of removal and optimum operating conditions. The economics for full-scale systems of varying daily capacities will be determined.

Also during this program, the possible presence and fate (after UF/Carbon) of toxic substances in industrial laundering wastewater will be investigated. These studies will be based on the EPA listing of 65 Toxic Substances . Analyses will be performed by GC/MS, spark source MS and A.A.

804370

Objectives of projet

Electrical mobility analyzers are being used with increasing frequency to determine the size distribution of the atmospheric aerosol. In particular, the Whitby electrical mobility aerosol analyzer has been used in the United States in several recent extensive air pollution field studies sponsored by the U. S. Environmental Protection Agency as well as by various state agencies.

However, up to the present time, there has been no independent effort at testing or calibrating the Whitby analyzer whose primary calibration has been based on aerosols genrated in the laboratory having composition and size distribution differing importantly from those typical of atmospheric aerosols.

In view of the ever increasing use of electrical mobility analyzers in laboratory and atmospheric aerosol studies, it is believed to be essential to obtain independent measurement and calibrations of such devices.

We wish to propose an independent investigation, of the measurement of the atmospheric aerosol with the Whitby aerosol analyzer using the diffusion battery facility and other aerosol measurement facilities of the Centre d'Etudes Nucléaires de FONTENAY AUX ROSES, France.

804375

The objective of this continuation grant is to define the distribution of pathogenic Naegleria in the State of Florida. Multiple isolates have been made from freshwater lakes as well as thermally polluted one. Overwintering appears to be confined to lake bottom sands and/or sediments. Over the next year this aspect will be or should be confirmed.

A rapid method for identification has been developed but requires additional testing of specimens from various areas.

Immunolcgical and physiochemical aspects of pathogenic Naegleria and seropositive nonpathcgenic Naegleria will be investigated to determine their relationship.

804401

1. To define and assess, qualitatively and quantitatively, the scope and magnitude of the military munitions demilitarization requirements.
2. To describe the demilitarization processes now in use, and those under development.
3. To define and characterize the typical solid, air and waste water effluents from the demilitarization processes.
4. To identify the disposal and treatment processes for the solid, air and waste water effluents of demilitarization, including both those now in use and those under investigation in military research and development programs.
5. To evaluate and arrive at conclusions on the effectiveness of various alternative solid, air and waste water effluent treatment and abatement methods for specific munitions and for specific demilitarization processes.
6. To define and recommend R,D&D programs for joint EPA-Military support, in order to enhance and facilitate the development of promising technology for economical demilitarization of munitions in a manner so as to minimize adverse environmental impact.
7. To provide a basis for transfer of useful technical information among EPA and the Military Services.

804404

The project will use bench and pilot scale studies of powdered activated carbon and ozone to determine efficiency of removing specific trace organic constituents from drinking water.

804413

This project involves the development of sensitive chromatographic procedures to analyze low levels of ammonia from atmospheric samples. GLC column technology will be investigated and the conversion of NH_3 to NO in conjunction with a chemiluminesence NOX monitor will be used to detect eluted ammonia.

804421

This research proposes to conduct a state-of-the-art review of the various thermal and chemical treatments for improving the quality of the fuel fraction of shredded municipal refuse.

From this review a selection of the most promising treatments will be made for subsequent laboratory evaluations. Also, the economics of any process to be studied in the laboratory will be carefully evaluated.

804424

This research project will develop quantitative models for first to third order woodland streams subject to natural perturbations as integral elements of ecosystem management. Specifically, additional dynamic models of stream processes will be synthesized at several levels of resolution based on a planned series of experimental investigations in natural streams and controlled channels. Parameterization and system model verification experiments are also planned. Techniques will be developed to permit reasonable estimates of system states from directly measurable stream variables.

R 804428-01-1

AN EVALUATION OF THE ANAEROBICFILTER AS A DEVICE FOR TREATING PHARMACEUTICAL WASTES

The proposed work envisions determining the effectiveness of anaerobic filtration for pharmaceutical wastes. Pilot scale studies will allow the development of design equations for scale up and provide a broader data bank for the applications of anaerobic systems. The usual concentrated wastes associated with this industry will not hinder the method's operation; production of methane and elimination of aeration costs will provide additional economic incentives.

804434

Nickel and chromium plating processes are used in the decorative finishing of automotive bumpers. Of the 8,000 pounds per day of nickel purchases, 460 to 640# are lost or discharged as a waste. Likewise, of the 750# per day of chromic acid purchases, 700 #/day are similarly discharged. The objective of this project is the recovery of nickel values for reuse as a raw material source in lieu of purchased nickel chemicals.

Nickel lost to waste treatment; i.e., as dragout from the plating baths, will be precipitated in a segregated stream as nickel carbonate, dewatered, and washed for removal of excess alkali precipitant and water soluble brighteners. A portion of the washed nickel sludge will be used in liquid form in place of purchased nickel carbonate for high pH carbon purification treatments. The balance of the high-purity nickel carbonate will be combined with the nickel-rich carbon mud residue that is normally discharged as a waste end-product at the completion of a batch carbon purification treatment. Regeneration of the combined nickel values is accomplished using sulfuric acid as the dissolving chemical. The nickel sulfate produced is a liquid solution and contains 50 gm/l of nickel. Heating is required for concentration to a plating bath concentration of 90 gm/l.

The regenerated nickel sulfate is returned to the source of loss at plating bath pH, following filtration. Since the majority of the nickel loss occurs as nickel sulfate recovery, regeneration and return is made in the same form.

A continuation project is proposed to report on the elimination of chromic acid discharge using a dual-purpose atmospheric evaporative tower which will be used to recover chromic acid from both the exhaust air and waste water discharge.

804443

Semi-empirical characteristic time correlations for pollutant emissions developed for simplified aircraft gas turbine combustors will be compared with exhaust emissions data for existing aircraft engines to test their applicability for the latter. The previous work indicates that an optimum geometry for minimum emissions can be defined for given combustor operating conditions and that the optimum simplified turbine combustor cannot meet 1979 Class T2 EPA emissions standards. If the correlations can be extended to more representative aircraft combustors, then it should prove possible to determine if the optimum combustor can satisfy the appropriate EPA aircraft standards; the work should thus prove helpful in exploring the stringency of the standards.

804450

The research will develop a planning tool for water quality analysis in non-designated 208 planning regions. The tool will include a model for preliminary screening to isolate problem areas of point and non-point wastes and evaluate information for follow-up detailed modeling to assess the impact of waste management alternatives. The planning model will function with a limited data base, and will provide high and low estimates for simulation results. The output will be designed for ease of interpretation by the planner. The non-point source data base and the loading functions developed by Midwest Research Institute will be used to estimate pollutant flux from watersheds.

Rivers, estuaries, and impoundments will be accomodated as well as storm water runoff. Several approaches to water quality modeling and analysis are included to offset the potential bias of any single method.

The product will be useful to provide prescreening for a large area and to focus on regions not conforming to the goals of PL 92-500, especially because it will be easily applied with a limited data base. Substantial saving in planning cost is expected without sacrificing accuracy in isolating problem areas

8044457

RESEARCH OBJECTIVES:

1. To study design and operational problems of commercially-constructed digesters and to develop creative and practical alternatives or modifications.
2. To develop methods of optimizing all products of the digestion process.
3. To develop optimization criteria for the integration of anaerobic digesters into rural and aquaculturally based environments.
4. To look at the legal, social, and political problems which may be created by large-scale digesters.
5. To conduct a systems analysis of environmental issues related to the processing of agricultural waste through anaerobic digesters.
6. To study the feasibility of producing alcohol to meet mobile fuel needs as part of the energy system on farms and in rural areas.

804458

This research will examine a mechanism of cycling for various xenobiotics in and through estuarine and marine sediments. A lugworm, Arenicola cristata (Polychaeta: Arenicolidae), will be studied to define and quantify movement of compounds through the sediment as a result of reworking and biological accumulation. Experiments are designed to determine, (a) how lugworms move xenobiotics into and through the substrate when the compounds are introduced into the overlying water column; (b) how effectively lugworms move sorbed xenobiotics from various depths in the sediment to the surface and (c) what volume of sediment could be exposed to xenobiotics due to reworking by lugworms.

804460

The principal objective of this project is the evaluation of ozone for disinfecting wastewater effluent. The ozone will be produced from oxygen with an air-cooled, plate-type generator and contacted with wastewater in a pressure injector. The wastewater will be monitored to determine the reduction of fecal and total coliforms before and after the application of ozone.

A secondary objective will be the development of cost data to establish the operating and maintenance costs associated with disinfecting wastewater with ozone.

This evaluation is the first full scale application of ozone for disinfecting wastewater with ozone that is produced from oxygen.

Before ozonation, the wastewater receives two stage oxygen aeration for carbonaceous and nitrification control, then two stage lime treatment, followed by dual media filtration.

804462

The Franklin Institute Research Laboratories, Science Information Services Department, proposes to provide key technical and administrative personnel, both government and non-government, with a current-awareness bulletin emphasizing advancements in the field of industrial technology as related to water quality and water pollution control. A monthly publication containing approximately 25 abstracts of articles and additional annotation citations pertinent to industrial technology will be prepared for and distributed to the aforementioned recipients. In addition, these abstracts will be input to the Water Resources Scientific Information Center to become part of their machine-retrievable data base and provide full text of abstracted documents. Annual subject and author indexes, a journal list, and a compilation of each of the monthly bulletins will be included in the final report, along with camera-ready copy of the entire final report.

804 469

A large body of research exists on intergrated regional enviornmental management systems. Yet the management approach discussed in this research does not go far enough in preparing implementation strategies for them. The Environmental Law Institute proposes to expand this research and to prepare a set of materials which would assist state and regional and local governments in developing sound implementation strategies for their environmental management programs.

The Institute would: extend the residuals management framework suggested in the existing research by developing components relevant to implementation would analyze in much greater detail than hertofore the governmental and social dynamics of the actual implementation of regional environmental management programs; would organize and interpret existing research according to the perceptions and needs or regional and local implementing entities; would update implementation research in light of additional experience; would develop the relationship between these approaches and the variety of federal and state environmental protection statutes and regulations already in effect; and would analyze EPA's existing authority in this area. As the vehicle for its research, the Institute proposes to prepare four published reports, each consisting of a short descriptive booklet and a longer technical companion monograph fully treating each topic.

804472

The recent evidence indicating that chlorination leads to the production of chlorinated organics such as chloroform has stimulated an interest in the use of ozonation as a disinfectant. Very little work has been done regarding the effect of ozonation on organics present in wastewater. The purpose of this work is to examine the influent and effluent from an ozonation unit in a sewage treatment plant in Estes Park, Colorado in order to more understand: 1. Which biorefractory organics are susceptiple to ozone? 2. What are the end products? 3. What are the important parameters? Samples of influent and effluent from the Estes Park plant will be collected, concentrated, and analyzed for the organic constituents. The levels of these organics will be correlated with parameters such as O_3 concentration, contact time, and TOC. The analytical methods to be used will include gas and liquid chromatography and GC - MS. Some toxicity studies will be performed as a part of an ongoing project employing various cells as a cytotoxicity test.

804474

Objectives: The overall objective of this study is to optimize a flow-through, clay-filter media system for recovering small numbers of viruses from large volumes of wate A high rate system, capable of concentrating and recovery of particulate-associated as well as "free" viruses from at least 100 gallon volumes of a variety of waters, is sought.

Approach: Current efforts will concentrate on three aspects of the study:

a. Continued evaluation of candidate filter systems capable of providing a sustained high flow rate in conjunction with the use of the bentonite virus concentration procedure.

b. Each candidate filter media system will be evaluated in terms of the optimal virus elution system required. Factors to be considered are system hydraulics system materials (composition and amount) and volume and type of eluant.

c. Successful bench scale filter-elution systems will be upgraded in prototype so that minimum test volumes of 100 gallons can be processed. Field testing in a variety of waters will be initiated.

The comparative evaluation of the developed methodology with commercial flow-through virus concentration systems which can handle comparable volumes of different waters will be conducted.

Progress: The use of the bentonite concentration procedure continues to be the procedure of choice for concentrating particulate-associated as well as "free" viruses from natural waters. A flow-through procedure using diatomaceous earth as a filter aid has been shown to be effective. However, hardware limitations have resulted in limited success in dealing with large volumes. Modifications to the filtration system is planned along with the evaluation of alternate processes.

R 804499-01

POTENTIAL BENEFICIAL USE OF INDUSTRIAL WASTE HEAT FOR GREENHOUSE PRODUCTION OF BEDDING PLANTS, CUT FLOWERS, AND FOLIAGE PLANTS

Water is used in industry for cooling purposes and is described as waste heat. In the past, the normal procedure has been to dump discharged cooling water coming from industrial factories back into rivers, large lakes and cooling ponds. The quantity of waste heat available in the U.S. is approximately 10^{16} Btu, which is equivalent to 1.6 billion barrels of fuel oil. This quantity represents an amount slightly less than 20 percent of all the energy used annually in the U.S.A.

The purpose of this project is to investigate the feasibility of using waste heat to control the environment of greenhouses. The major overall objective is to determine if high cash value crops such as ornamental and vegetable bedding plants, cut flowers, and foliage plants can be successfully grown in greenhouses heated and cooled with water heated to simulated temperatures normally associated with discharged water found in industry.

Plants will be grown in three plastic covered greenhouses. The temperature in one of the greenhouses will be controlled by pumping heated water through plastic pipes underneath it and by blowing heated or cooled air through the other two greenhouses.

804503

The purpose of this investigation is the characterization of northern Lake Michigan in terms of physical, chemical, and biological environments and to provide data for comparison with future studies of the degree and rate of environmental change. Some of the objectives are:

1. To determine the vertical, horizontal and seasonal variations in selected nutrients and other chemical and physical parameters.

2. To determine the effects of islands and their associated morphometry on enviroconditions and to contrast environmental conditions near islands with nearshore areas of the mainland.

3. To analyze phytoplankton, rotifer, and crustacean zooplankton species composition and abundance in northern Lake Michigan.

4. To utilize data on phytoplankton and zooplankton community structure as an indicator of the trophic status of waters in northern Lake Michigan.

5. To provide phytoplankton and zooplankton data that will be useful in conjunction with other parts of the study to assess biological responses to nutrient conditions in northern Lake Michigan waters.

S 804504-01-0

DEMONSTRATION OF A PROCESS TO MEET BEST AVAILABLE TREATMENT STANDARDS FOR CHROME TANNERY EFFLUENT

This research and demonstration project is to demonstrate the technical and economical feasibility of meeting "Best Available Treatment Economical Achieveable" guidelines for the tanning industry utilizing an electroflotation process (Lectro Clear) and zonal control of dissolved oxygen in an oxidation ditch (Carrousel) to nitrify and denitrify the wastewaters. Water reuse, energy conservation and sludge handling and utilization are also incorporated in the project.

804509

The objective of this research is to improve the performance of the "Probability Based Matching" (PBM) and the "Self-Training Interpretive and Retrieval System" (STIRS) for computer examination of unknown mass spectra. PBM improvements to be developed include: a ranking system to reflect directly the reliability of the answer; a system for unknown mixture spectra in which the best-matched reference spectrum is subtracted from the unknown and the difference spectrum is examined again by PBM; skewing of the unknown spectrum to change the relative abundances of peaks as a function of mass; correction for the cross-correlation of the uniqueness of mass values; and statistical tests to determine the recall/reliability performance of the resulting PBM system. The main objective for STIRS will be to develop a reliable and automatic program for the prediction of the molecular weight of the unknown.

804511

Objectives: 1) To determine the feasibility of using municipal sewage sludge to reclaim and vegetate land disturbed by mining activities; 2) To evaluate methods for the processing, transportation, spreading and incorporation of the sludge into the land; 3) To demonstrate application rates that will maximize benefits to soils, improve water quality, and make lands agriculturally productive; 4) To evaluate the effect of varied sludge applications on vegetation establishment and growth (grass, legume and tree species), including foliar analysis to determine nutrient uptake and potential heavy metal toxicity; 5) To evaluate the effect of the sludge applications on the chemical quality of percolating recharge water; 6) To determine the degree of site amelioration resulting from the sludge application by monitoring physical and chemical changes of the surface spoil or refuse material; 7) To evaluate the effect of the sludge application on the quality of the groundwater and/or the quality of the nearest receiving stream and/or surface water runoff by a monitoring program.

Project Description: The proposed project contains three phases. Phase I is concerned with the processing of sewage sludge at the sewage treatment plant and its transport to and delivery at the strip mine sites. Phase II concerns the application of the sludge to the land and the revegetation measures necessary to return the land to productive use. Phase III is project evaluation.

Total EPA Cost: $300,000

804516

The objective of the proposed research is to define the chemical equilibria between trace metals and the soluble and insoluble organic and inorganic fractions of sewage sludges and sludge-amended soils. The research involves the development and use of techniques to determine the chemical forms of trace metals in sewage sludges and sewage sludge-amended soils, the identification of the types of metal-ligand complexes present, and the determination of stability constants for the inorganic and organic complexes identified. Cadmium, zinc, nickel, copper and lead are the trace metals that will be studied in this research.

804518

The above project's purpose is to acquire real time data from the Milwaukee River for the determination of the impact of combined sewers on water quality and the analysis and verification of this impact using water quality models.

The approach of this project will be to monitor this river from the onset of an overflow event through the recovery of water quality three or four days later. The river will be monitored at four or six hour intervals during this time at five separate locations. The resulting data will be compared with Harpers Multi-Parametric Model which simulates this river system with CSO loadings from the Storm Water Management Model for the 6000 acre combined sewer area. Various modifications of the loadings and coefficients in Harper's Model will be made to evaluate the resulting changes in water quality.

804525

The objectives of this proposal are to isolate microorganisms capable of metabolizing dibenzo-*p*-dioxin, dibenzofuran and some of their chlorinated derivatives. The organisms will be used to elucidate the mechanisms used by microorganisms to degrade this group of compounds.

The approach will rely heavily on the isolation of mutant strains that accumulate biodegradation products in the culture medium. These products will be isolated and identified by conventional techniques of organic chemistry.

Current plans call for the use of enrichment culture technique for the isolation of different microbial species. Cultural conditions will be established for the accumulation of different biodegradation products. Selected strains will be treated with nitrosoguanidine and organisms that accumulate significant quantities of metabolic products will be used to establish biodegradative reaction sequences.

804528

Resources for the Future proposes to prepare a handbook for residuals-environmental quality management. The purpose of this handbook is to bring together in one place the relevant techniques of analysis, and methods of organizing the data, for doing regional residuals-environmental quality management planning under a variety of contexts. The handbook will be an "operational" document which will: (1) take the user through the process of planning from obtaining and organizing the data through the presentation of results; (2) provide the user with methods of analysis for each of the components of the management system and for evaluating alternative management strategies; and (3) provide guidelines for selecting the degree of sophistication to be used in analyses for planning purposes in relation to the residuals management problems in a region and the resources available. Particular attention will be given to the following: (a) the importance of undertaking no more sophisticated analysis than is necessary to provide adequate information for making decisions on management strategies; (b) the utility of, and methods for, generating information on the distribution of costs; and (c) intermedia effects.

Although governmental agencies at all levels have been planning the management of, and managing, residuals for decades, typically these activities have been performed in a manner which: (1) involved consideration of only a small range of physical methods for improving ambient quality; (2) involved consideration of only a small range of implementation incentives to induce residuals dischargers to change their behavior; (3) concentrated on a single environmental medium and ignored the intermedia effects; and (4) concentrated on physical methods and ignored the critical elements of legislation, implementation, monitoring, and enforcement. If the demand for improved ambient environmental quality is maintained in the United States, at the same time that population and the economy grow, the costs of achieving the desired levels of ambient quality may be large--both absolutely and relatively--if only traditional approaches to residuals management are adopted. Recent federal legislation--particularly the Clean Air Act Amendments of 1970 and the Water Pollution Control Act Amendments of 1972 (as well as their proposed 1976 amendments)--mandate and provide funding for particular planning activities: state implementation plans under the former; facilities plans (Section 201), areawide plans (Section 208), and basin plans (Section 303) under the latter. Federal funds have also been provided for preparation of state and local solid residuals management plans.

Consequently, not only is there a need for analysis and planning because regional management problems exist, but because various planning efforts for residuals-environmental quality management have specifically been mandated by legislation.

804 530

This is a study to determine the relationship between the quality of drinking water and urolighiasis (a major National health problem). Previous studies suggest there is a relation between the quality of drinking water and urolithiasis; however, the validity of the conclusions of these studies remains uncertain because of uncertainty about the water actually consumed by stone farmers. In this study we intend to sample the house water actually used by patient and control subjects.

804533

(1) Objectives: 1. Evaluate overall effectiveness of the disposal pits currently in use based on materials previously deposited in each. 2. Determine presence or absence of environmentally hazardous compounds in each. 3. Continue to sample each pit during tenure of study. 4. Establish experimental systems for studying the fate of selected pesticides in isolated micro-pits under controlled conditions. 5. Evaluate biological activity in present systems. 6. Develop plans and specifications for disposal system construction and management.

(2) Approach: Conduct a 5 yr. chemical and biological study of 2 existing pesticide disposal systems used at the Agronomy-Ag. Engineering and Horticulture Stations which have been in use 10 and 5 years respectively. Additional controlled micro-disposal systems will be established to determine the fate and biological consequences of known quantities of selected disposed compounds. Accurate data will be collected on identity, quality and concentration of unusual dilute insecticides, fungicides and herbicides deposited in existing and two new disposal pits. Reliable recommendations for disposal systems for farms and commercial application should be developed as a result of the study.

(3) Current Plans: Chemical and biological studies of the existing systems will be initiated in May, 1976 with the new micro and macro experimental pits being developed during the summer. Based on 1976 studies, an improved commercial applicator, research-station type pit system will be implemented in 1977 based on the 1976 results. Climatological data will be collected during the 5 yr. study and correlated with chemical and biological degradation in the systems.

804536

will be installed
Stations/to measure water discharge and to take volume-integrated samples as well as discrete samples during storm events. These samples will be analyzed for concentrations of pesticides, particulates, mineral nutrients, heavy metals, organic matter, bacteria, and various pathogens as well as pathogen indicators. Installations will be built on three field sized and various parts of a basin sized watershed. Rainfall amounts and intensities, soil moisture and temperature, wind speed and direction, sunlight intensity, and evaporation rate data will also be collected. This data will be used by the E.P.A. watershed modeling group at Athens, Ga. to test and to develop models for pollution due to run-off from fields and watershed basins in agricultural areas. The principal land use categories to be studied are row-crops (especially corn), pastures, forest, and freshwater wetlands. Research on the kinetics of herbicide breakdown in soils and the products of degradation will be initiated.

804541

This investigation will examine the toxic, sublethal and latent effects of certain polycyclic aromatic hydrocarbons and barium sulfate on larval and adult stages of selected invertebrates and fish. Experiments are designed to determine the effects of these compounds on (a) crustacean molt cycles, (b) regenerative limb growth, (c) respiration, (d) heart rate and (e) histology and ultrastructure of selected tissues. Studies are aimed to determine the uptake by marine organisms of these pollutants from water and bioaccumulation through aquatic food chains. By using a combination of autoradiographic and convential analytical techniques the sites and extent of accumulation of pollutants in marine organisms will be determined.

804542

Environmental pollution raises two problems—what are its effects and how should it be controlled. The development of regulations that protect society and its natural surroundings, that do not unnecessarily restrict industrial activity, and that can be implemented with legislation and by administrators requires the evaluation of valid scientific data. For this purpose, scientists must design monitoring systems and experiments and develop and apply methods to analyze the data collected. These activities are interdisciplinary. Combined talents in varied relevant disciplines are required to provide the necessary data and understanding of the scientific issues and options provided by them.

The Fourth Symposium on Statistics and the Environment is intended to promote interaction and to encourage cooperation among statisticians, toxicologists, epidemiologists, and other scientists who deal with issues of environmental management scientifically or administratively.

804 545

A tolerable level of an air pollutant is less than that which causes morbidity in the most susceptible population. The level must also be shown not to have a long range effect of contributing to both morbidity and mortality through the undermining of sturctural and functional reserves of organs and tissures of the body. An abnormal loss of reserves (hypeinopenia) leads to increased vulnerabiluty to disease in general; and progressive, insidious damage and cell population loss leads to a subclinical disease state (morbility) which places a heavy burden on the functioning cell populations that remain. A prime example of morbility is subclinical emphysema where it now appears that as much as 50% of the total lung tissue can be lost throgh a covert, destructive process, and yet clinical signs and symptoms are not detected, and pulmonary function tests only begin to show abnormalities. This exemplifies the need for discriminants to determine the influences of air pollutants, singly and in combination on tissue reserves, and on the development of subclinical "pre-lesions" and "pre-disease" states.

A number of new pathophysiologic and pathobiologic descriminants are being proposed for morbility testing, including measurements of plasma protein loss, overload of epithelial cell protein transport, excessive tissue protein loss, abnormal permeability to tracers (ferritin, peroxidase), altered diphosphoglycerate content of red blood cells, and Type 2 cell hyperplasia and hypertrophy in association with Type 1 cell loss. There will be correlative electronmicroscopy, disc gel electrophoresis, and histochemistry, studies. Mice, guinea pigs, and rats will be exposed to nitrogen dioxide, sulfur dioxide, and ozone (singly and in combination). The ultimate goal is the determination of health risks form ambient pollutants as a rational basis for assistance in the establishment of air quality standards.

804547

To characterize the forms and amounts of Cu, Zn, Ni, and Cd in sewage sludges and soils amended with sewage sludge.

To determine the stability of metals added to soils by sewage sludge application and the effects of soil factors on their stability and bioavailability.

Radioisotopes, non-aqueous extractants, specific metal extractants, and equilibration techniques will be utilized.

804 562

A light-scattering aerosol counter can discriminate among particle shapes, as well as sizes, by employing more than one photodetector. The proposed project is a feasibility study for a continuous-flow, light-scattering aerosol counter which can discriminate asbestos fibers from less asymmetric shapes by their light-scattering signatures.

804569

1. Objectives: To determine by epidemiologic and supportive laboratory data the association of recreational water quality and the health of bathers. Particular emphasis will be given to evaluate the microbiological criteria used by health officials to determine if natural waters used for bathing are safe. 2. Approach: To survey bathers and non-bathers at a beach area with low average annual coliform counts, and at another beach area with high, unacceptable, average annual bacterial counts and to determine the incidence of respiratory, gastrointestinal and cutaneous illnesses occurring in the course of a three week period. Water quality will be continually measured for various biological, chemical and physical parameters such that the health risk of bathing in a water of known quality can be ascertained. 3. Progress: We have identified a beach near Cleveland, Ohio as a beach with "Marginal" water quality and a beach near Toledo, Ohio as a beach with "Acceptable" water quality. Both beaches are situated on Lake Erie. We have made collaborative arrangements with the Department of Health, the State of Ohio for approval and assistance with the study.

804570

Recycling digested municipal sewage sludge in agricultural systems is an attractive alternative method if "safe" disposal management techniques can be devised that do not endanger human health. Sludge may contain hazardous amounts of bacterial and viral pathogens, heavy metals, chemicals, drugs, mycotoxins, and/or parasites. Animals produced from grains and/or forages fertilized with sludge or from pastures which allow direct ingestion of sludge will be examined regularly for their physiology, blood chemistry, weight gain, and performance. Animal carcasses, including bone and organs, will be examined for pathogens, heavy metals, drugs, chemicals, and mycotoxins. Assessment will be made of possible entry of such deleterious materials into the human food chain as well as identification of management practices, rates of sludge application, and cumulative effects on cattle, swine, and poultry, three important food animals. Characterization of the sludge prior to utilization will be made and management practices developed to reduce the potential hazards to acceptable levels. Preliminary trials with direct feeding of dried sludge to cattle reduced weight gains slightly and changed the heavy metal content of certain organs. In a related trial, 11 bred gilts fed rations containing either 0, 10, or 20 percent dried sewage sludge for 10 months showed neither growth suppression, nor effect on litter size nor performance. However, significant differences in hematocrit and prothrombin levels occurred between pigs from the three groups.

804 571

Because of growing public concern over the occurence of trace amounts of various organic chemicals in the area potable water supply, the Jefferson Parish Water Department has recognized the need for a more efficient and reliable treatment process designed to remove such contaminants.

The Mississippi River is the sole raw water source available to the Jefferson Parish Water System. Therefore, since the use of another less polluted source is impossible, The Department is faced only with seeking out new methods for removal of trace levels of organic contaminants.

One such method offers the most promise of effuting trace organic compound removal. It is the use of granular activated carbon (GAC) filtration. GAC filtration will be thoroughly studidd in quantitative terms and in terms of cost effectiveness during the course of this study.

804572

Research to define conditions before and after restorative dredging for Collins Lake (22 ha.), Schenectady County, New York, under the auspices and funding of the Environmental Protection Agency, is proposed. Detailed vertical profiles of transparency, temperature, dissolved organic matter, suspended solids, dissolved oxygen and major plant nutrients are proposed for four stations on a repeating basis continuing for two years. Volume of flow, temperature, dissolved organic matter, suspended solids and major plant nutrients will also be monitored at the single culverted outlet and the outlet of the decanting field on selected dates every two to four hours synchronously with mid-lake station sampling. Correlation of outlet water characteristics with those of the main lake may permit the development of a logistically simplified monitaring program using only outlet waters.

Phytoplankton and zooplankton will be sampled at the four mid-lake and two outlet stations on a schedule permitting integration with physical and chemical data. Rooted macrophytes will be sampled along standard transects and at fixed stations and voucher specimens prepared, in series of at least twenty specimens per species, toward the detection of change in form and growth habit. Successional events and processes will also be considered.

Fishes will be sampled by various means, identified, weighed and measured toward recognition of condition indices, growth rates, and histological signs of environmental stress.

804573

The ability of the herbivorous zooplankton to regulate algal productivity in highly eutrophic Saginaw Bay (Lake Huron) and Western Lake Erie will be determined. Total grazing, as well as size-selective feeding on small flagellates as well as large diatoms and blue-green algae will be measured in the field. This information on important carbon fluxes is vital to the modeling team responsible for the ultimate synthesis of data on Great Lakes ecosystems. Field studies of grazing will depend on ^{14}C tagging techniques. In the laboratory the feeding habits of rotifers, often ignored, will be investigated using new particle counting techniques combined with computer analysis. All of these investigations will be based on progress made by an experimental team during the Upper Lakes Reference Study. Results already show that the crustaceans control algal production in open lake only during the fall months. Biological control of the growth of blue-green algae failed to develop in mid-summer. Discovery of the degree of biological control in the most eutrophic areas of the Great Lakes is vital to understanding the functioning of these ecosystems, ultimately producing validated simulation models for them, and finally managing algal bloom problems.

804577

The objectives of this project is to delineate growth of lung function and to identify and study the pulmonary alteration produced by microbial infections of the respiratory tract in a longitudinal population of children living in an area of low environmental pollution.

Recent evidence that certain uncomplicated upper respiratory infections (URI) induce pulmonary function abnormalities in adults prompted a prospective study in children where such infections occur more frequently. In a longitudinal study, 55 children aged 2.5 - 9 years were observed for a mean duration of 2 years. Spirometry and lung volume studies were obtained routinely every 3 months, with each URI and 4 weeks post-illness, providing data on 636 well and 260 illness observations. After grouping of data by sex and age (< or > 84 mos), each spirometric parameter was analyzed using linear regression with individual identification, height, and clinical status (normal/URI) as independent variables. Adjusted mean values of forced vital capacity (FVC), 1 sec forced expiratory volume (FEV_1), peak expiratory flow rate (PEFR), midmaximal expiratory flow rate (MMEF) and expiratory flow rate at 50 per cent FVC ($\dot{V}_{50}$) all decreased during URI; 35 percent of these changes were significant with $P \leq$ o.1. The data suggest that lower respiratory tract involvement without signs or symptoms of lower airways or alveolar disease occurs with URI of varied etiology in childhood.

804579

The proposed Study is to analyze the data collected in the investigation of pollutant dispersion near highway (EPA grant No. R-803881-01) undertaken by the New York State Department of Environmental Conservation. The major thrust of the work is the evaluation and necessary modification of existing highway dispersion models utilizing the data base created by the on-going research project 'ROAD'. The data will be utilized to develop statistical parameters that quantify the ability of the model to predict air pollution from roadways under nearly all types of meteorological conditions. The situations where current models are applicable will be identified and improvements will be suggested to several models to result in improved air quality estimates. Emphasis will be placed on developing practical techniques of pollutant estimation using input parameter values commonly available from highway studies.

804584

We propose to investigate the fate in the aquatic environment of $3,3^{1}$dischlorobenzidine (DCB). The specifice objectives of the investigation are as follows: 1) to study the degradation of $3,3^{1}$-dichlorobenzidine by naturally-ocurring microbial communities in lake or river water and to determine the kinetics of the process; 2) to identify the products resulting from the microbiological transformation of dichlorobenzidine; 3) to determine the sorption and desorption of dichlorobenzidine in lake sediment; 4) to study the uptake and metabolism of dichlorobenzidine by fish; and 5) to determine if aquatic microorganisms can liberate dichlorobenzidine from dichlorobenzidine-based azo dyes.

^{14}C-uniformly ring-labeled dichlorobenzidine will be used to investigate the fate of the chemical. The fate of ^{14}C-DCB will be determined by measuring the disapperance of the parent compound and the evolution of $^{14}CO_2$ and by analyzing the water, sediment and the organisms for products resulting from degradation of the test chemical. The metabolites will be detected by thin-layer, paper and gas-liquid chromatography. The identify of the metabolites will be confirmed by infrared, NRM and combined GLC-mass spectrometry.

804 585

Ozone is a common contaminant in urban atmospheres and some people, upon exposure to this substance, develop chest discomfort, pain on breathing, and significant decrements in pulmonary fucntion associated with increased airway resistance. These symptoms are much like those seen in asthma and they suggest that ozone may cause the degranulation oa mast cells and the sequential release of a mixture of vasoactive mediators consisting of histamine, slow-reacting substance of anaphylaxis (SRS-A), prostaglandins, and other substnaces. It is proposed to investigate the validity of this hypothesis by measuring the amounts of these materials released from the lungs of rats, guinea pigs and rabbits which have been exposed to 0.5, 1.o, 1.5 and 2.0 ppm for 4 hours. In addition, measurements of the capabilities of lung tissue from such exposed animals to take up serotonin and norepinephrine, to convert angiotensin I to angiotensinII, and to convert cortisone to cortisol will be made. All of the measurements will be correlated with damage to lung tissue as reflected by the change in oxygen consumption of lung tissue after exposure to ozone. Finally the animals will be pretreated with suitable drugs which prevent the release of specific mediators. Thereby, it is hoped to prevent lung damage by ozone and to identify the mediator(s) responsible for the damage.

804587

The principal objective of this project is to develop a body of information on the disinfection potential of ozone for viruses which have been attached to or incorporated within various solids. The solids to be used will be clays, hydrated aluminum oxide flocs, human epithelioid carcinoma cells and fecal material. The viruses to be used will be poliovirus 1 (Mahoney), coxsackievirus A9 and the f2 bacteriophage. Additionally, information on the inactivation of Escherichia coli and Streptococcus fecalis under conditions similar to the viruses will be obtained. Modifications to obtain additional inactivation will be made where it is found that adsorbed or protected viruses are inactivated at a slower rate than the unprotected virus. These modifications will include longer contact times, increased ozone concentrations and decreased particle size in the case of the fecal material and aluminum oxide floc particles.

804589

The project seeks to establish expectance values for the variability of a proposed fractionation scheme which permits the determination of mass and principal organic class loadings in industrial feedstock, process and waste stream samples. Organic class determination will be achieved by infra-red and mass spectroscopic measurements of materials separated by liquid chromatographic methods. The project also seeks to define standardization methods for porous polymer absorbents used in vapor-phase sampling of flue and stack gases. In addition, the effect of exposure to acid gases on the selectivity and capacity of such materials will be studied.

804 592

The general objectives of this proposal are to evaluate the effectiveness and operational and maintenance characteristics of eight existing intermittent sand filtration systems used to polish stabilization pond effluent to meet new standards. Three systems will be sampled extensively and the remaining five will be evaluated for operational and maintenance characteristics and costs. The effort will be concentrated on determining the operational and maintenance costs and procedures because previous investigations have established the efficacy of the intermittent sand filter as a means of removing algae from stabilization pond effluents. Sampling sites will be selected to ensure that geographic and weather conditions are considered. Design and operations manuals will be prepared based upon the results of this study and the previous investigations.

804594

CASE CONTROL STUDY OF WATER QUALITY AND CARCINOGENESIS IN PENNSYLVANIA.

An epidemiologic study to evaluate retrospective study techniques for relating cancer to individual environmental exposures.

804595

In June 1976 the U.S. Environmental Protection Agency awarded a research grant to the Mineral Research Center to carry out a research investigation of new techniques for control of smelter arsenic flue dust wastes.

The Mineral Research Center is tudying fixation of arsenic flue dust wastes by various techniques such as arsenic fixation by molten waste slags from different smelting operation, fixation at high temperatures by clays, some industrial by-products and phosphate rock, fixation by cement and concrete mixtures, and fixation of arsenic at low temperatures by clays, phosphate rock, and some industrial by-products. Initial results of arsenic incorporation in these media and the leach test results are encouraging.

Under subcontract, the Anaconda Company Research Laboratory in Tucson is studying the extraction of arsenic, by chemical leaching, from the flue dust wastes and has recently started tests on fixation of extracted arsenic in aqueous media.

First Year: A literature search and report on the geochemistry, chemistry, and metallurgy of arsenic was prepared to provide guidance for the laboratory studies. Laboratory feasibility studies have been conducted to screen the effectiveness of selected fixation techniques. Pilot plant studies of the removal of arsenic from flue dust wastes by chemical leaching were essentially completed.

Second Year: Leaching tests of the "fixed" products resulting from several fixation techniques will be performed to determine resistance to leaching under environmental conditions. Studies of separation by chemical leaching andsubsequent fixation will be completed.

804596

The objectives of this project is to develop reliable culture procedures and techniques to recover and enumerate *Shigella* in polluted water. Conventional enrichment media for Shigella have been developed to isolate these microorganisms from fecal specimens from patients suspected of having Shigellosis. Levels of *Shigella* under these circumstances are generally high. In contaminated water, however, the levels of *Shigella* relative to interfering microorganisms are exceptionally low. In addition, many of the interfering microorganisms have a bactericidal and bacteriostatic effect on Shigella. Enrichment media are being evaluated that minimize the effect of antagonistic microorganisms.

804 597

The objective of this project is to v rify and demonstrate proposed sweet corn processing modifications which if implemented could effect reduction of water use and water pollution. The proposed modifications are directed towards the production of unit or uncut kernels for freezing and canning.

Water use and pollution are reduced by processing unit kernels since the extent of cut surface exposed to wash and blanching water is reduced. Furthermore, a greater portion of the corn kernel is recovered from the cob for use as human food. Proposed methods under investigation for producing unit kernels include a coring procedure in which the kernels are sawed off the cob at a point below the kernel tip. These kernels are then cleaned to eliminate extraneous cob tissue. A second method produces unit kernels by rubbing or rolling kernels from their sockets in the cob after the cob itself has been split into two or more lengthwise sections. Application of these methods to field processing in which a husk and cob remain in the field is also under study.

804600

The primary objective of this program is to study air sampling filter media and to evaluate the available commercial filter media in terms of their sampling efficiency, resistance to flow, dust holding capacities, moisture retention characteristics, and other physical properties of interest. All major commercial filter media will be studied. The end result of the project will be the preparation of a "Filter Handbook" in which the major filter characteristics are described. In addition, a concurrent study will be undertaken to relate the sampling efficiency and flow resistance of filters to those predicted by theory. Also, the "series filter" method will be studied as a possible alternative to the dichotomous sampler for separating atmospheric particles into a fine and a coarse fraction with a cut point near 2.0 um.

804606

Summary

(1) Objectives: To compare whether the experience, as determined by the incidence of peripheral chromosomal aberrations, of young adults emigrating from and immigrating to an area with perpetually high levels of photochemical air pollutants differs significantly from students already living in the respective areas. Secondary objectives include the influence of a change in residence on the incidence of chromosomal aberrations, the persistence of chromosomal aberrations already present at the time of immigration, and the effect of other environmental and lifestyle factors.

(2) Approach: 400 non-smoking, non-imbibing, non-drug-using new students (ages 17 to 22) at two Seventh-day Adventist colleges were pre-selected for this study. Objectivity in preparation of blood culture and evaluation for chromosomal oberration is assured since neither collaborating laboratory knows the origin of the samples. Chromosomes of each student are evaluated for the frequency of breaks, gaps, isogaps, hypo- and hyper-diploidy, endoreduplications, terminal blebs, and stable changes such as dicentrics, quadriradials, inversion, and translocation.

(3) Current Plans and/or Progress: Lifestyle and demographic characteristics of the subjects have been analyzed. Three blood sampling periods have been completed. The frequency of chromosomal aberrations from the first blood samples are being statistically evaluated. Chromosome scoring of the other samples is currently in progress. It is planned to follow this group of students into their child-bearing years to determine if observed chromosomal aberrations have any correlation with the outcome of pregnancies.

R 804607-01-0

CHEMICAL AMPLIFIERS AS ODD HYDROGEN RADICAL DETECTORS

The objective of this proposal is to measure odd hydrogen species that are present in the atmosphere. A free radical chain of reactions will be used as chemical amplifiers. The chain will convert undetectable H, OH, and HO_2 into measurable signals.

804609

The overall objective of the three year study is to devise a new, more effective and pollution-free method of preservation of water and wastewater samples. Approaches such as the use of antibiotics and bacteriolytic enzymes for controlling microorganisms may offer a distinct possibility and an improvement over existing procedures.

The first year of the project was devoted to evaluation of the effectiveness of several antibiotics/antibiotics mixtures and bacteriolytic enzymes in controlling microorganisms in water and wastewater samples as revealed by viable cell count and oxygen consumption rates.

After testing a large number of antibiotics singly and in mixture of 2-4, 5-7 antibiotic mixtures have been selected based on their effectiveness in controlling microorganisms in wastewater and natural water samples. Commercially available lysozyme preparations failed to control microorganisms when added with or without EDTA and Tris.

Analysis of nutrients in the presence of antibiotics has revealed that the combinations which include erythromycin or ampicillin cause interference in some analytical determinations.

The second year of the project will be devoted to determination of the relative effectiveness of the preservatives selected for further study, in preventing alteration in sample test parameters. The effect of water parameters such as pH, particulate matter, industrial contaminant, etc. on the preservation method will also be ascertained. Studies will also be initiated to study the effectiveness of the preservation method as a function of storage parameters and sample handling.

804 610

The principal objective of this research project is to determine whether the potential link between arsenic and carcinogenesis might occur because arsenic is acting as a cocarcinogen, that is, arsenic is promoting the effect of an initiator (carcinogen) of cancer formation. The subordinate objectives are: (1) to determine the metabolic route for the oxidation of arsenite to arsenate and its subsequent methylation to the organic arsenic by the liver and (2) to modify an analytical technique for arsenic determination to suit the needs of this study.

The approach to be taken in this research proposal is to study the above stated objective by utilizing a mammalian cell culture system as a model rather than using the conventional whole-animal approach.

804611

(1) OBJECTIVES: The objective of this work is to determine the levels of halogenated volatile purgables, volatile non-purgables, and halogenated phenols in drinking water, human blood, and human adipose tissue and to correlate the concentration of these toxicants with the levels found in Miami's drinking water.

(2) APPROACH: Develop methodologies for these three groups of toxicants in water, blood and adipose tissue. Dose experimental animals with these chemicals to determine levels in blood and fat tissues to establish if these halogenated chemicals bioaccumulate in fatty tissues, and what type of equilibrium occurs for these chemicals between blood and fat.

The animal study will lead to the final portion of the investigation which is a pilot epidemiological study to relate levels of these toxicants in drinking water with the levels detected in human blood and adipose tissue.

(3) CURRENT PLANS AND/OR PROGRESS:

The halogenated purgable volatiles and a few halogenated non-purgable volatiles and non-purgable non-volatiles have been detected in municipal water, human serum and adipose tissue. Negligible amounts of these toxicants were found in well and bottled water.

In general, the preliminary data indicate that the approach in this study is feasible, and these toxicants are present in general population at low levels.

804612

The Ohio State University, Center for Lake Erie Area Research (CLEAR) proposes to conduct studies of (1) water quality, particularly nutrients/oxygen relationships, in the western and central basins of Lake Erie and (2) fish larvae in the western basin and Sandusky Bay. A comprehensive study of the status of eutrophication in Lake Erie is now being completed by CLEAR in support of an assessment of the effectiveness of nutrient control programs (EPA Grant No. R-802543). A subproject of this grant deals with populations estimates of fish larvae in western Lake Erie. Data generated by these studies also form the base of deterministic models now under development by EPA, Large Lakes Research Station, Grosse Ile, Michigan. The proposed project will build on the information obtained through the current project. The general objectives of the proposed work include:

1. To determine the concentration and quantity of nutrients, oxygen and biomass indicators in the the waters of the central and western basins of Lake Erie.
2. To determine the kinds and quantities of contaminants entering western Lake Erie under "runoff event" conditions and to identify distribution patterns in the Lake.
3. To estimate fish larvae populations in western Lake Erie and to assess the impact of intake entrainment on

804613

To identify biochemical and organic indicators of ground-water pollution. This project is in two parts,

1) Biochemical Indicators

   Investigate the use of ATP, nucleic acid, proteins, organic phosphates and enzymes as indicators. Development of extraction and analysis techniques.

2) Organic Indicators

   Study sorption, retention, and modification of organic compounds that are added or arise by microbial or chemical action. Predict fate of such compounds and develop analytical techniques.

804614

(1) Objectives: The principal objective is to develop recommendations with respect to heavy metals for the safe application of wastewater sludge to agricultural land. Specific objectives are: (1) evaluate plant uptake of metals wxxk as a function of sludge and soil properties and management practices; (2) determine possible interactions of metals which affect their availability and (3) evaluate new procedures which measure metal bio-availability.

(2) Approach: Field, greenhouse and laboratory research with differing soils amended with wastewater sludge varying in metal content will be conducted. Metal uptake by plants will be related to measured soil properties, sludge types, and soil amendments (e.g., lime). The relationship between Zn and Cd with respect to plant uptake and extractability will be evaluated using radio-isotope exchange procedures.

804 615

This project is designed to complement U.S.EPA studies of organic materials in public water supplies and water supply sources throughout the country. Specific objectives are: 1. To conduct plant-scale evaluations of the influence of various water treatment processes, or modifications of those processes, on the removal of organic materials from the river water and the formation or removal of halogenated hydorcarbons; 2. To evaluate the effect of present processes for public water supply treatment on the organics in the treated water and the influence of seasonal and other variations in the type and concentration of organic compounds in the Ohio River on the organics in the treated water. With the cooperation and financial support of some public water supply utilities using the Ohio River of major tributaries as the source of water, periodic raw and finished water samples, gas chromatograph analysis of purgeable and solvent extract portions will be utilized for detection of organic materials. Treatment processes in selected plants will be modified and process samples will also be analyzed for organics. GC/MS equipment will be used for identification of individual compounds. Total and fecal coliform and total bacterial densities will be determined during all plant modification studies to insure that the bacteriological quality of the water is not adversely affected.

804 617

This project is designed to evaluate the human health effect of arsenic and selenium in drinking water where concentrations exceed current standards in certain communities of Millard County, Utan.. Water and Air monitoring will provide environmental exposure data. Body burdens of arsenic and selenium will be evaluated in the first phase of the study by sampling scalp hair and urine from school children, ages 12-18. The second phase of the study will involve families of long residence in the study area. Medical histories; physical examinations and samples of scalp hair, blood, urine, home tap water and housedust will be obtained and evaluated for impact or arsenic and selenium on health.

804620

1. Objectives Evaluation of groundwater quality in the Chino Hydrologic Basin indicates degradation due to saline pollution leached from the wastes of dairy cows. The manure of these animals is known to contain some nutritional value. Technology exists by which this feed can be recaptured. If the quality of the food produced is comparable to more normal rations a viable means of waste disposal will be available. This project is designed to test and demonstrate the value of the feed produced from cow manure.
2. Approach Dairy cow manure will be collected from dairies in San Bernardino County and converted to feed products. This feed will be presented under test conditions to growing dairy heifers, beef cattle and chickens to determine its value in comparison to standard rations. Laboratory evaluations shall be conducted to determine the ability of the feed to support the growth of rumen microbes and to assay the amino acid content of the feed. Toxic metal deposits in the feces, tissues and organs of the animals fed in the program shall be evaluated.
3. Current Plans The various work projects outlined in the Approach have been delegated to several campuses of the University of California and San Bernardino State College where experts in the required scientific fields are on staff. These people will perform the work and report their findings.
4. Schools Involved: A. University of California, Davis
   B. University of California, Riverside
   C. California State College, San Bernardino

804621

During the initial period of this grant new procedures, specifically the determination of alkylation of macromolecules (histidine in hemoglobin) and an extraction-concentration procedure for analysis of body fluids from treated animals was developed, and will be incorporated into the combined testing protocol (C.T.P.). Hycanthone was used as a model compound in the C.T.P. and the following procedures were found positive: Direct metaphase analysis, micronucleus test, urine-Salmonella TA1538, induction of anaphase abnormalities using urine, and inhibition of unscheduled DNA synthesis in GO lymphocytes with urine extracts. Sister chromatid studies and germinal cell changes are yet to be completed.

804622

"Microcosm and Theoretical Evaluation fo Substitute Chemicals" - The objective of this grant is the development and verification of a theory to test the effects of chemicals on the environment through the use of laboratory microcosms.

804623

Purpose: To conduct a joint project which will alert nurse personnel on the handling, recognizing, preventing and verifying the cases of pesticide poisoning.

The project has three primary goals:
1. To improve pesticide protection through implementation of safety, training and pesticide protection for nurses, nurse practitioners, emergency rescue teams and emergency room staffs in protective aspects of pesticide safety for the occupational employed worker.
2. To develop and improve nurse management role in pesticide related illness including systemic illness and topical effects of pesticide on the skin and eye.
3. To set up a network of recommendations for a laboratory verification program of alleged pesticide illness through screening and definitive blood and urine metabolic studies.

Phase 1 will develop a pesticide management handbook for nurses and nurse practitioners with accompanying teaching slide cassette.
Phase 2 will train nurse practitioners and nurses in 130 rural health care clinics for the three migrant streams.
Phase 3 will initiate and implement a laboratory verification program.

804631

This project will obtain hydrologic and chemical data for runoff events on three selected watersheds with different livestock pasturing regimes. The hydrochemical data will be evaluated and compared to hydrologic history of the watersheds to identify hydrologic factors and the livestock/agronomic management practices that contribute to or decrease the contribution of pollutants to non-point surface runoff. Also the degree of bacterial pollution present in non-point surface runoff from cattle pastures will be established. This data will be used in developing runoff-loading models for pasture land to assess non-point source pollution potential.

A Memorandum of Understanding between the Ohio Agricultural Research and Development Center (OARDC), Wooster, Ohio and the USDA-ARS North Appalachian Experimental Watershed (NAEW), Coshocton, Ohio, enables these institutions to conduct cooperative research. The watersheds at NAEW for this project have over 30 years of hydrologic history. Pasturing regimes to be monitored are: (1) rotational pasturing of cattle in the summer and winter feeding on one watershed with hay brought to it, (2) summer rotational pasturing only, and (3) winter pasture where cattle are fed saved autumn regrowth and hay harvested on the site.

Periodic sampling of storm events has been initiated for the three pastured watersheds. Also, a forested, control watershed is being sampled (composite). Runoff samples are being analyzed for N (NH_3, NO_2/NO_3 & total-N), total-P, TOC, COD, BOD, sediment yield and sediment N and P. The project was initiated on 11/1/76 and will last three years.

804632

Lifetime exposures to lead and other metals in excess of the amounts which can be eliminated are indicated by quantitation of these elements in the shed deciduous teeth. The amount of lead has been determined in tooth samples of 12,000 children living in Cleveland and 11 of its suburbs. The first objective of this project is to complete analyses and locate the areas which have high incidences of exposures to excess lead.

804633

1. Project Objectives

a) To construct the dislodgeable residue profile for ethyl parathion (o,o-diethyl-p-nitrophenyl phosphorothioate) and its environmental conversion product paraoxon (o,o-diethyl-p-nitrophenyl phosphate) in an emulsifiable concentrate and a wettable powder formulation in a Florida round orange ecosystem; and

b) To determine the influence of environmental variables on these profiles.

2. Project Approach

a) Experiments will be conducted during the periods June-Aug., Nov.-Jan., and Mar.-June. These periods represent distinctive environmental conditions in Florida. Temperature, humidity, free water on leaves and fruit, rainfall, solar incidence, and wind speed and direction will be monitored during each experiment.

b) Pesticides will be applied with conventional means and sampling of air, leaves, soil, fruit, and cover crop with time will be performed. GLC analyses of residue levels will be run with complete chemical characterization of conversion products.

c) Comprehensive statistical analyses will be run on the data with particular attention paid to the correlation of residue levels with environmental variables.

804634

Objectives: To develop a specific analytical technique through the use of a specific sulfuric acid reaction with a dye precursor to produce a sulfonated dye which can be readily identified and measured by its colorimetric absorption spectrum.

Approach: To impregnate a high efficiency filter with the dye precursor. The filter can then be used to collect the sulfuric acid particles. This brings the sulfuric acid into direct contact with the precursor which will then react to form a sulfone dye. The amount of dye formed can then be measured directly by the color change on the filter. Or the dye can be rinsed off the filter with a suitable solvent and measured spectrophotometrically.

Progress: Studies are being conducted to check the dye precursors for their reactivity and to start a study of the quantitative relationship between the amount of color formed and the amount of sulfuric acid aerosol sampled.

804635

The survival of virus in water treated with disinfecting agents is critically dependent on the physical state of the virus particles in the water. This research is directed to reveal the nature of virion aggregation, to measure it as precisely as can be, and to seek quantitative relationships between the data so gathered and the inactivation rate of virus infectivity for different disinfecting agents operating on the aggregated virus. Agents of primary interest will be the various active forms of chlorine and viruses of chief concern will be those of the enteric group. Quantitative techniques will be used for direct observation and assay of virion aggregation by electron microscopy supplemented by more sensitive but less direct differential ultracentrifugation. Complex formation between virions and particulate matter in the water will be examined as well as the efficiency of clumps of virions in plaque formation, the possibility that virus may exist in a conformationally resistant state, and the increase of titer of chlorine-treated virus through subsequent aggregation. These experiments will be done by a group consisting of 2 halogen chemists and 2 virologists with one biophysicist directing.

804636

The federal water pollution control laws encourage the application of sewage sludge to agricultural land and for other beneficial uses as the preferred solution to this ultimate disposal problem. Because of the high capital and energy costs of reliable sludge treatment and disinfection, less costly and simpler treatment alternatives are being sought. Thermophilic aerobic digestion of sewage sludge offers promise of improving sludge management at a low cost. The possibilities of using the heat released during microbial oxidation of the sewage sludge to autoheat the waste liquid sludge has been considered by a number of investigators. The heat of oxidation of organics appears to be capable of autoheating sewage sludge at 95 to 97% water content to the thermophilic range only if the aeration system can achieve an oxygen transfer efficiency greater than 15%. Since most conventional aerators achieve transfer efficiencies less than 5%, it has been suggested that aeration with oxygen enriched air or pure oxygen would be necessary to support the concept of autoheating. Presently, a full scale commercially available unit being operated at Cornell University has been shown to be able to achieve thermophilic temperatures with a simple air aeration system using autoheating with a substrate similar to primary sewage. This study will determine the feasibility of treatment of primary and secondary sewage sludge with this technology.

804637

The objective of this grant proposal is to conduct a comprehensive investigation to determine, based on state-of-the-art environmental systems models, the feasibility of developing and implementing a complete executive program to interface automatically various basin water quality models for use by relatively inexperienced modelers. Specifically, in addition to determining the technical feasibility of development, an estimate of the cost of development will be made as well as an estimate of the length of time required to carry out such an undertaking.

Ultimately, this executive program should have the capability to integrate various water quality, point source and non-point source models and to simulate and analyze the consequences of implementing land-use alternatives and pollution control strategies. The executive would calculate all pertinent parameters and coupling efforts so that socio-economics, energy and economic constraints can be considered in a coherent manner.

804 639
The objective of this project is to evaluate selected surface treatment agents for protection and restoration of shoreline and salt marsh areas from oil spills. The selected agents are those recommended by four laboratory scale projects funded by the American Petroleum Institute (API). This project proposes to evaluate the effectiveness of their agents to protect shoreline and salt marsh areas from spilled oil in "real world" situations.

The project will involve full scale field testing in which the selected surface treatment agents will be applied to shoreline and marsh areas at a designated test site. Oil will be spilled at the test site on an incoming tide and directed to the areas protected by the surface treating agents. Measurements will then be taken to determine the effectiveness of each agent in protecting the shoreline and marsh areas.

804640

This project will:

a. investigate the feasibility for the removal of certain refractory organic compounds from water at the concentration levels such compounds are often found in raw and treated drinking water supplies. The method to be explored consists of oxidation with ozone/oxygen or ozone/air in the presence and absence of ultraviolet radiation.

b. determine the rates of oxidation of such compounds under various reactor conditions, i.e. intensity of ultraviolet radiation, temperature, concentration, etc.

c. determine by MS/GC the intermediate and final oxidation/photolysis products which are formed from the O_3/UV treatment of a series of appropriate compounds, including: halomethane precursors (humic acids), halomethanes including particularly chloroform, a polycyclic aromatic hydrocarbon, polychlorinated biphenyls, and other selected organics which occur in natural and treated waters.

d. evaluate the feasibility of utilizing ozone/UV treatment as a practical means of removing refractory organics from water, and establish the design parameters for the process at an appropriate scale.

804643-

A computerized data base containing nonpoint sources loading functions and values for nonpoint source loads will be developed. This computerized data base will be constructed such that it is compatible for linkage to a basin-wide planning model.

804647

The primary purpose of the proposed program will be to determine the major photooxidation products of polynuclear aromatic hydrocarbons(PAH)and their distribution. These studies will be designed to partially elucidate "weathering" phenomenon of petroleum at an air-water interface of marine environments. Particular attention will be given to the photooxidation products which may have mutagenic or other biological properties.

A model laboratory system simulating environmental conditions will be constructed d employed to generate photoproducts. Following solvent removal, photoproducts will separated by thin layer, gas and liquid chromatography. Identification will be carried out by GC-MS-Computer combination as well as IR and UV. The half-life of the more mutagenic and toxic products under such conditions will be determined. Attempts will also be made to assertain where in the water column the major photooxidation products accumulate.

804650

We have developed and are continuing the testing of a quick, sensitive method of detection of water born carcinogens using laboratory reared fish, as a part of an overall screening system for carcinogens. We hope to extend the technique to a tissue culture system. Early applications are also planned to include the examination of the kinetics of transmission of carcinogens along naturally occuring food chains.

804652

Crustacean zooplankters are important indicators of water quality. In order that more biologists may become familiar with these organisms, we propose to prepare an illustrated guide to the crustacean zooplankton of the Great Lakes region. A truly functional guide will be devised using dichotomous keys, line drawings, and photomicrographs. Diagnostic characters primarily observable under low power magnification will be emphasized. In addition, the value of particular species as water quality indicators will be stressed through the inclusion of environmental requisite data from the literature and our own investigations. Improvement of inter-laboratory quality control in water pollution monitoring and surveillance will result from this project. The guide will be specifically addressed to the economically and ecologically important Laurentian Great Lakes, but will be useful in inland lakes and streams of the region as well. Furthermore, it will serve as a model for similar regional guides that could be produced in other geographically distinct areas of the United States.

804653

In many practical situations where the atmospheric boundary layer structure has to be known, e. g., in calculating the diffusion and dispersion of pollutants, dynamic wind load on structures, etc., the ground surface is rarely flat and homogeneous as required by many theoretical approaches.

Before expensive field experiements for studying the effects of topography in the atmosphere are undertaken, some basic understanding of such flows through physical (laboratory) and numerical modeling studies is needed. Thus this investigation will have as its objective the understanding of the effect of small and meso-scale topography on the boundary layer flow. This will be accomplished by theoretical, numerical, and laboratory-model (wind tunnel or towing tank) studies.

804654

This project will investigate the effects of diurnal flow variation on the performance of a fluidized bed reactor for the secondary treatment of municipal sewage. The fluidized bed reactor consists of a 2 foot diameter column, 15 feet high which is partially filled with sand, treating a nominal flow of 72,000 gpd. The system treats wastes biologically at significantly higher rates (shorter detention time) than conventional biological treatment systems. Because of the high reaction rates pure oxygen must be supplied to the system rather than air. The ability to supply oxygen to the system efficiently is, therefore, very important. A new energy saving oxygen transfer device, called the "E-Z Gas" system, will be evaluated in conjunction with the fluidized bed reactor. Upon completion of the project, an engineering feasibility report on the applicability of the process for full-scale design will be prepared.

804655

A full scale demonstration of novel dialysis system for treatment and recovery of nickel from plating job shop rinse water.

804 656

The sepcific objective of this proposed research is to develop an activated carbon process for the treatment and disposal of chromium-containing industrial wastewater.

Three major experiments will be conducted in the laboratory:

(1) Batch adsorption kinetics experiment. - To obtain in the laboratory the rate equation for the removal of hexavalent chromium by activated carbons.

(2) Regeneration experiment. - To improve the carbon regeneration methods currently developed by the principal investigator and his associate with more thorough investigation into the various parameters associated with each regeneration process.

(3) Column experiment. - To establish the important design criteria of fluidized activated carbon bed.

The techncial and economical feasibility of the activated carbon process will be assessed. A strategy for the operation of such activated carbon process will also be developed and suggested.

804 657
The proposed work will be carried out at the Central Contra Costa Sanitary District Water Reclamation Plant and includes the following main tasks:

1. Evaluate the performance of selected control strategies that are regulating the operation of advanced wastewater treatment unit processes that have the intrinsic potential for over-consumption of energy and process-expendable materials. All control strategies are implemented with software in a digital control system; performance and cost comparisons are drawn between automatic versus manual implementation of the control strategies at a manual service level equivalent to the annualized incremental cost of the automatic components of each control strategy.

2. To evaluate the utility of a sophisticated plant management information system (MIS) oriented to the management of wastewater treatment operations. Particular emphasis is placed on the cost effectiveness of MIS in providing accurate design data with the potential for reducing construction costs for future plant expansions.

804 685
(1) The objective of this program is to devleop a practical process for the use of actual industrial waste chemicals as detoxification reagents for other toxic and/or hazardous industiral waste chemicals.

(2) Specifically, the uitlwzation of waste hexavalent chromium solutions to oxidize waste heavy-metal cyanide solutions, together with the application of other wastes for pH control, catalysts and for final polishing treatment will be investigated.

(3) Preliminary laboratory and literature investigation has indicated that the process does work and is theoretically feasible for the intended results.

804653

The principle objectives are:

a. Examine the effectiveness of measuring a limited number of parameters to evaluate the processes of eutrophication of a large lake.

b. Ascertain the eutrophic stage of the Eastern Basin of Lake Erie, as well as an ecological baseline for evaluating the effectiveness of pollution abatement programs.

c. Evaluate the nature and extent of problems associated with over-enrichment as well as the effectiveness of pollution-abatement programs on a large lake.

d. Provide input to state of the Great Lakes Report for the International Joint Commission.

The twenty-six (26) Eastern Basin stations, utilized in 1974 and 1975, would continue to be monitored using the R.V. Dambach. These include collection sites in the nearshore as well as mid-lake areas. Five (5) general cruises would be made, one (1) each in the months of early July, early August, September and November 1976 as well as April 1977. The July-September samplings will cover the period when the Lake is thermally stratified. Three (3) intensive monitorings for up to forty-eight (48) hours at one station will be done on three (3) occasions: 14-16 July, 24-26 August, and 15-18 September. The major purpose of the intensives are to contrast the variations noted at a single site over a two (2)-day period with those observed between the twenty-six (26) stations during a single cruise. Another purpose of the 24-26 August sampling, which will

804659

We propose to perform calculations, using a recently developed theory, to estimate the effect of particle size and refractive index on the Raman scattering cross sections for molecules comprising all or a constituent part of small particles. These calculations will be coordinate with experimental work at the National Bureau of Standards directed toward the analysis of molecular species contained in small particles. The numerical studies will permit extension of the present technique for qualitative analysis of particulates to a more quantitative basis, since to this point no theory has been available which predicts the dependence of the total Raman signal on particle size, shape, refractive index and orientation with respect to the illumination and collection directions. Calculations to elucidate these dependencies may also lead to estimation of the distribution of the molecular species within the particle (e.g. uniform distribution throughout the particle or concentration in a surface layer). It will also provide information which could lead to improvements in the design of the present instrumentation. Theoretical studies will be undertaken to extend the present theory to nonspherical particles and to nonuniform light sources.

804660

The program here proposed is a continuation of the preliminary work cited in reference 1 and described in BBRC Report F75-18.

The goal of the proposed effort is to develop a hydrophobic substance to mitigate pavement ice adhesion which will be cost-effective as compared to conventional methods. Specific objectives are; a) the traffic paint employed as a binder in one of the formulations from the initial effort will be improved, b) the concentrations of the active ingredients in two coatings involving multiple components will be optimized, c) while the basic goal of a coating to be applied to existing roadways will be retained, the fundamental concepts of an ice release material will be further investigated by a brief study of the incorporation of otherwise unsuitable materials into 2.5 cm (one inch) asphalt overlays, d) the functionally superior coatings resulting from the technical work here described will be tested on a full scale traffic simulator under varying monitored conditions of tire-surface interface.

804661

(1) Objectives are to (a) develop a "framework" for the systematic analysis in the socioeconomic context of policies to control hazardous wastes, (b) to make a generalized analysis of the majority of existing and potential policies for hazardous waste control, and to array these policies so that the different impacts and trade-offs between alternative policies are demonstrated.

(2) Approach will be to identify the "parties-at-interest" and the nature of the impacts to which they are subjected, together with their possible responses. This will lead to generalized policy analysis using benefit/cost analysis techniques for quantifiable elements. Impacts of each policy-waste combination will be compared. The approach will be demonstrated by the use of one or two case studies in which the analysis is pursued in greater detail.

(3) The one-year project is expected to commence in summer of 1976.

A National Conference on Irrigation Return Flow Quality Control is proposed that would be held on the campus of Colorado State University during May, 1977. The EPA irrigation return flow research and development program has made substantial progress since the last National Conference on Managing Irrigated Agriculture to Improve Water Quality, which was held in Grand Junction, Colorado from May 16-18, 1972. The EPA research is now providing insights into the alternative processes for implementing an action program for controlling the quality of irrigation return flows.

The primary objectives for this conference will be to: (1) present the results of the EPA irrigation return flow research and development program; (2) integrate the research results into an interdisciplinary approach for solving problems of irrigation return flow quality control; (3) provide a forum for presenting and discussing the alternatives in implementing irrigation return flow quality control; and (4) conduct a post-conference workshop on future research needs.

804672

An Environmental Planning Manual for Salinity Management in Irrigated Agriculture will be prepared. The primary focus of this manual would be a delineation of the combination of technological and institutional solutions, the various levels of planning effort, use of existing data and necessary field investigations required for the different planning levels, methods of data analysis technological and socio-economic considerations in implementing a salinity control program, and finally, recommendations for formulating an action program.

The primary audience for this manual will be environmental planners such as EPA Regional Offices, state water pollution control agencies, regional councils of governments, and 208 (Section 208 of PL92-500) planning groups.

A booklet will be prepared which is a condensed version of the manual. This will be a well-illustrated multi-colored booklet portraying the highlights contained in the manual.

In addition to the booklet, a narrated colored slide show would be prepared. The booklet and slide show would have a compatible format.

804673

The specific objectives of the proposed project are:

(a) Test the single-equation model with data from as many locations as possible. This will be accomplished using data that have been or are currently being collected by industry and state and federal agencies on existing surface mines in the Rocky Mountain region.

(b) Document the basic data requirements and the procedures by which these data can be obtained.

(c) Prepare a set of charts and nomographs from which the values of all required model parameters can be determined from the basic field data and reclamation plan.

(d) Integrate the results of objectives a, b, and c into a manual of procedures for estimating the effect of surface mining on the quantity and quality of water resources in the mined watershed.

(e) Demonstrate the use of the manual using data contained in an actual environmental impact anlysis.

804675

summary is to be used for these purposes.

The objective of the symposium is to present recent developments in the technological, economic, scientific and sociological aspects of the cycling of petroleum in freshwater, estuarine and marine environments.

Session I: Sources and Distribution

Session II: Cycling

Session III: Effects of Hydrocarbons on Biological Systems: Behavioral, Physiological, and Morphological

Session IV: Sociological Implications of Hydrocarbon Use

Session V: Panel Discussion

Symposium: 9-11 August 1976; American University, Washington, D. C.

804677

The study is an evaluation of a treatment system consisting of three lagoons and a spray runoff irrigation facility. Laboratory investigation will be conducted primarily to determine feasibility and operation procedures for various modifications which will be monitored in the field. The system is designed to treat the total plant effluent from 50,000 live weight killed per day.

The objectives of this study can be summarized as follows:

- To demonstrate the operation of an inexpensive simply operated slaughterhouse wastewater treatment facility which will meet the 1983 National discharge limitations.
- To evaluate the use of spray runoff irrigation in a cold climate.
- To evaluate the effectiveness of the combined anaerobic lagoon pretreatment and storage to enhance the effectiveness of spray runoff irrigation.
- To evaluate the effectiveness of batch chemical treatment directly in a lagoon for phosphate and suspended solids removal (including algae) and disinfection.
- To develop basis of design for the proposed treatment system, and to present these design details sufficiently clear to allow their use by slaughterhouse operations with little technical assistance.
- To present estimates of costs for treatment to allow economic comparison of this system to others capable of treating these type wastes.

804679

The overall objective of the project is to develop criteria for operational policy decisions for the management of natural resources as related to the coal strip mining industry to minimize potential pollution of air and water resources of the semi-arid Southwest. Specifically this phase will focus on defining the systems and subsystems for potential mining problem areas on the Black Mesa section of northeastern Arizona and to quantify their components and constraints. The approach will be to first make a preliminary problem survey and to describe and quantify, if possible, the component subsystems involved in the reclamation of land subjected to coal mining activities. Possible subsystems envisioned for the reclaimed land include improved grazing, runoff farming, water harvesting, recreation and wildlife habitat. A data bank will be established from existing information and data and additional environmental monitoring of air and water (both surface and ground) resource parameters as indicators of potential pollution. This is the first phase of a more comprehensive study envisioned for this project which will implement an environmental monitoring scheme for land treatments to be installed on the reclaimed land.

804681

Our objectives are threefold: (1) refinement of a new differential medium to provide a sensitive method for detection and quantification of *Yersinia enterocolitica*, (2) elucidation of the ecology of *Y. enterocolitica*, and (3) clarification of the relationship between the water strains of *Y. enterocolitica* and the strains of animal and human origin.

Toward the achievement of these objectives, we have developed a differential medium for *Y. enterocolitica* employing manganous sulfate and urea as the indicator system. We are presently testing the efficacy of this medium with various selective agents when using membrane filtration isolation procedures. After extensive laboratory testing of our method, we will do a field study to quantify *Y. enterocolitica* in water as well as in other environmental sources. To date, using *non*-quantitative methods, we have isolated 62 strains of *Y. enterocolitica* from water plus 2 strains from fecal swabs of squirrels and 3 strains from rodent burrows.

Over the past year, we have subjected our isolates and strains collected from others (a total of 200 strains) to 300 tests. The data generated by these tests will be statistically analyzed and relationships between the organisms graphically depicted using numerical taxonomy methods. These relationships will be further confirmed by DNA hybridizations and bacteriophage typing.

804682

1. The objective of this work is to demonstrate effective removal and concentration of metals from plating wastes by a process involving coupled transport through membranes. Concentration is effected by "chemically pumping", i.e. allowing a flow of a coion in the opposite direction.
2. Our study is being phased. In the first 3-month phase, we have demonstrated in the laboratory that metal ions (copper, nickel, and chromium) can each be concentrated against its concentration gradient by means of coupled transport through membranes. In the second 9-month phase, we will demonstrate the process in the field. A mobile unit will be constructed with approximately 50 ft of membrane. The effect of flow rate on performance will be established in the laboratory. The unit will be tested on actual plating waste waters, and attainable concentration factors will be measured. An economic analysis will be performed.

804683

A cooperative effort is being pursued between the Academy of Natural Science: of Philadelphia and the University of Maryland to study the ecological effect of ozone produced oxidants to selected estuarine species. We are determining the toxicity of ozone produced oxidants, both lethal and sublethal effects, to selected commercially and/or recreationally important estuarine finfish and shellfish species and their life stages under various environmental conditions. We are also comparing the toxicological effects of ozone produced oxidants to those of residual chlorine which are being determined on the same species and life stages under the same experimental regimes set forth above. Finally, we are evaluating the environmental acceptibility of ozone as an alternative to chlorine.

804 684

The purpose of the proposed research is to measure the capacity of selected clay minerals and waste coal chars to adsorb hazardous organic compounds from pure aqueous solutions of the compounds and from manufacturing wastes that contain the compounds. The adsorption will be measured as a function of pH, concentration of adsorbate and adsorbent, and time. The adsorption of families of compounds will be measured to systematically determine the mechanisms responsible for adsorption. To aid in a systematic evaluation of mechanisms responsible for attenuation, a comprehensive critical review of literature will be undertaken The various adsorbents tested will be evaluated as to their potential usefulness as liners for landfills accepting hazardous organic bearing wastes.

The results of this study should allow predictive models to be developed that will aid researchers and regulatory agenices in prediction of adsorption behavior and the relative pollution hazards of untested compounds with similar structures.

804685

(1) The objective of this program is to develop a practical process for the use of actual industrial waste chemicals as detoxification reagents for other toxic and/or hazardous industrial waste chemicals.

(2) Specifically, the utilization of waste hexavalent chromium solutions to oxidize waste heavy-metal cyanide solutions, together with the application of other wastes for pH control, catalysts and for final polishing treatment will be investigated.

(3) Preliminary laboratory and literature investigation has indicated that the process does work and is theoretically feasible for the intended results.

804686

This study should provide present and historical rates of accumulation of metals and nutrients in the fine-grained sediments of Lake Huron. This project is a continuation of an earlier EPA funded study (R803086) of the southern part of Lake Huron. Multiple undisturbed 50 cm long sediment cores collected from over a wide area of the lake are sectioned aboard ship using a hydraulic extruding system which permits precise centimeter thick sectioning of fluid sediments near the sediment water interface. Core sections, frozen aboard ship for preservation, are subsequently freeze dried and acid extracts are analyzed for Na, Mg, Ca, K, Mn, Fe, Zn, Cu, Ni, Pb, Cr, P. In addition selected samples are analyzed via neutron activation analysis for Al, Ca, Fe, K, Mg, Mn, Fe, Na, Ti, As, Ba, Br, Ce, Co, Cr, Cs, Cu, Eu, Hf, La, Lu, Rb, Sb, Sc, Sm, Th, U, V, and Yb. Some cores are sectioned and sections squeezed aboard ship, at *in situ* temperatures under nitrogen to obtain pore water. The distributions of dissolved Na, Mg, Ca, K, Mn, Fe, Si, P and selected minor elements provide estimates of diagenic mobility and sediment-water exchange rates. At some locations we are also measuring the vertical distribution of benthic macroinvertebrates, as their activities in near surface sediments not only alter element profiles but affect sediment-water exchange. To determine element accumulation rates sediment cores are dated by the lead-210 method. Recovery of the sediment-water interface is checked by measuring the distribution of fallout cesium-137.

804687

Objective: To determine the effectiveness of a lake rehabilitation program that includes storm sewer diversion, nutrient inactivation, and aeration at Mirror and Shadow Lakes in Waupaca, Wisconsin.

Approach: Studies will emphasize the effect of treatment on: 1) inlake concentration of phosphorus, 2) recycling of phosphorus and reduced metal species from the lake sediments, 3) phytoplankton productivity, biomass, and taxa, 4) inlake concentrations of NH_3-N, NO_3-N, and organic-N, 5) water transparency, 6) dissolved oxygen depletion rates, 7) zooplankton densities, distribution, and taxa, and 8) benthic macroinvertebrate repopulation rates.

Progress: The project will start in 1976.

804688

The objective of this study is to establish life history and ecological information about salt marsh communities in the North Edisto estuary, Leadenwah Marsh. This site was chosen because of its isolation from excessive influence of human activities. Additionally the site is adjacent to the E.P.A. Bears Bluff Field Station. There, studies on effects of low levels of halogenated pollutants upon mixed communities of marsh organisms are being done. Studies of the life histories of organisms on the oyster beds, mud, and marsh grass habitats will supply valuable baseline data about breeding cycles, ontogeny and trophic relationships, thereby providing insight for the ecosystem models run at Bears Bluff.

The basic study plan combines expertise in mycology, plant physiology, parasitology, genetics, invertebrate and vertebrate zoology, and ecology.

The second year of the study will focus more closely on studies on productivity and trophic relationships among the marsh organisms. Under consideration (among other studies) are habitat selection and trophic relationships of: amphipods, fishes, and fish larvae in the upper marsh; intertidal and subtidal benthic crustacea; and fishes of the larger creeks.

804689

In freshwater environments, limiting nutrient for biological production is frequently P followed by N. Recent studies of nutrient-limited growth in phytoplankton revealed that growth rate is regulated by intracellular nutrient pool(s). In case of P, cellular inogranic polyphosphate (PP_i) is the growth regulating pool in Scenedesmus sp. and this pool also appears to affect P uptake along with external P levels. For N, such a reserve compound has not beein investigated. Therefore, it will be investigated whether the involvement of PP_i in P-limited growth and P uptake is universal in organisms belonging to various taxonomic groups and whether there exists N pool(s) similar to PP_i for N-limited growth and N uptake. Attempts will be made to develop kinetic models for growth and N and P uptake involving nutrient pools.

The transition between N and P limitation is an important aspect in polluted environments. Growth during this transition is described by a simple threshold equation of nutrient-limited growth. This implies that differing optimal N/P ratio in competing species may be a basis for ecompetitive exclusion and coexistence. Therefore, the variability of the ratio in various species will be studied.

In addition to the above problems, the effect of the major environmental variables, temperature and light, on growth and nutrient uptake will be investigated.

Emphasis will be placed on the phytoplankters of the Great Lakes and experimental studies will involve the examination of kinetics in continuous culture.

804691·

The objective of the project is to upgrade the quality of Clear Lake by reducing the inflow of nutrients from storm sewers and other man-made drainage systems.

804692

Surveys conducted by the California Department of Health have indicated that substantial quantities of hazardous wastes are being disposed of into the State's lands and that much of it is being handled and disposed of in a manner which creates health hazards and environmental degradation. The primary cause of these problems is a widespread lack of knowledge on proper methods to identify and characterize hazardous wastes and on safe methods to handle and dispose of them. The Department is, therefore proposing a study to answer many of these questions. The Department is impowered by the Industrial Waste Act of 1972 to develop a program to regulate and control hazardous waste management to protect the public health and environment. This includes the planning and coordination of research in the field. The Department, thus, is presently engaged in implementation of a State Hazardous Waste Management Program and is actively conducting research in the field. An experienced staff of hazardous waste experts will coordinate the proposed study, and the extensive laboratory facilities of the Department are available. The State-funded resources to be used will be primarily the time of the Waste Management Unit staff needed to coordinate the project and the equipment used in normal program activities. One research specialist, two laboratory chemists, and one clerk typist will be hired to conduct the study. They will be housed in the Department's laboratories and the Waste Management Unit's present offices. All costs associated with their activities, including special equipment, will be funded by the proposed grant funds. The knowledge generated by this study will be of great assistance to all areas of the State Hazardous Waste Management Program. In addition, the resulting practical field manuals on analysis and handling of hazardous wastes will be of great aid to waste handlers in their efforts to prevent injuries and environmental insult.

804693

The objective of this project is to determine the effectiveness of a PVC recovery technique through comparison of properties of the recovered material to virgin stocks. The method to be employed will use solvents for polymer purification. Property tests will dwell on application, polymer and rheology. An existing laboratory scale unit will be used to produce the material.

804 695

This project will demonstrate the restoration of a 122-acre eutrophic lake in Noble Coutny Indiana through removal of agricultural nutrients (phosphates) from the waters flowing into the lake and the removal or inactivation of phosphates remaining in the lake. Inflow will be controlled through diversion and through the construction and treatment of sediment basins in the major inflowing stream. Nutrients will be removed through weed harvest and through chemical inactivation of the bottom sediments. The project will reduce the eutrophication process, provide better light penetration and a sparse population of vascular hydrophytes.

804 696

1) Objectives - To demonstrate that iron control, integrated with nitrogen control can produce a new, viable, long term lake reclamation.

2) Approach - An eight task program is designed to eliminate iron sources (leaf loading, macrophyte metabolism) in the lake and to reduce nitrogen loading and recycling in the lake.

3) Progress - Phase I demonstrated that iron removal prevented blue-green algal blooms and reduced total population.

804697

The general objectives of the proposed research are to investigate the absorption characteristics of prolate spheroidal models of man and animals exposed to electromagnetic radiation. In particular we will calculate the field distribution inside the prolate spheroid model consisting of homogeneous tissue characterized by known valuesof $\varepsilon(\omega)$, $\sigma(\omega)$ and μ_o at and near resonance as a function of frequency of the incident radiation. The electromagnetic radiation will be in the form of a plane wave propagating in an arbitrary direction polarized either in the plane of the wave vector and the major axis of the spheroid or normal to it. We will evaluate the power absoprtion pattern for these two cases as a function of frequency, eccentricity of the ellipsoid and the direction of the wave vector. We will also calculate the total power absorbed and the Relative Absoprtion Cross Section (RACS). The analytical technique for the analysis and computations amenable to the study of this problem at the present time are the spheroidal wave function expansion and the point matching technique using either the spheroidal or the spherical wave functions. These results are essential for biological researchers in obtaining tissue absorbed power density estimates in terms of incident electromagnetic radiation in order to establish a sound electromagnetic safety standard.

804700

If fabric filters can be made to operate at higher than conventional velocity, a proportional reduction in filter size and initial cost will be possible, making these efficient collectors attractive for many applications where they are not currently used. For example, a high velocity filter operating at a superficial filtration velocity of 25 cm/s (air to cloth ratio of 50 cfm/ft^2) need be only 10 to 25 per cent as large as a unit operating at conventional velocities.

The objectives of this project are: (1) to study the practicality of high velocity fabric filtration, (2) to investigate phenomena which limit effective high velocity operation, and (3) to develop mathematical models to interpret and predict fabric filter performance. These objectives will be met using experimental work with a three bag pilot scale filter cleaned by the pulse-jet principle, and theoretical work to describe filter performance mathematically.

804701

The objectives are: To provide meaningful toxicological data upon which to base ADI's and to define the most sensitive index of toxicity, are grand and the object of all toxicological research.

804 703
This project is a Research Educational Program that will try to answer the question about applying sewage sludge on land. The question is - Will people allow it to be recycled on land if they know how and why?

Educational research will be conducted and tested which will go in depth with selected people in the community.

Attitudional Research surveys will be conducted at the outset and at the conclusion. This research will determine the degree of change of attitude about application of sewage sludge on land, and also determine most effective educational methods.

804707

Restoration consists of construction of an outlet to lower the lake level after large storms. Topsoil and less permeable soils will be removed to allow improved recirculation into the groundwater system. The lake will be drawndown to allow desiccation and consolidation of nutrient laden sediment. Settling ponds are to be constructed so runoff from the watershed can be collected and treated. Recirculation and aeration is proposed for re-establishing a fish population.

804709

Objectives

1. To evaluate the effects of blending two or more waters of different origin and inorganic chemical content in public water systems as related to consumer acceptance and consumer costs directly attributable to water quality.

2. To quantify corrosion rates and calcium carbonate deposition tendency in dynamic water systems before and after blending in order to develop control measures to minimize deterioration of water system facilities and household plumbing.

Approach

Data will be gathered on eighteen water quality parameters to measure changes in chemical composition related to corrosion and stability, dissolution of metals from water system facilities and household plumbing, and deterioration in quality with respect to turbidity, color, and esthetic acceptability at the consumer tap.

Current Plans

The EPA Mobile Water Quality Research Laboratory will be deployed at selected sites within the service area of the Metropolitan Water District of Southern California where imported waters from the Colorado River and California aqueducts are blended within its distribution system or mixed with local groundwater sources of its member agencies. Chemical and physical testing will be performed continuously for periods of 48 hours or longer with an on-board computer to take and store data which will be transferred to MWD's computer center for statistical analysis and xy (concentration vs. time) plotting.

804710

A one year study for the removal and recovery of fluoborates from electroplating waste streams using ion flotation is being carried out. The basis for this study are the results of a preliminary investigation where it was shown that over 90 percent of the fluoborate may be removed from a plating waste stream sample using the acetate salts of n-alkyl amine surfactants as the flotation agent.

The goals of the investigation will be to optimize the ion flotation process for removal of the fluoborate, breaking of the resulting foam, process development for recovery of the surfactant and the fluoborate and a pilot plant design for on-line evaluation.

804713

The Proposal is for lining or riprapping 5,550 feet of eroding lake shoreline.

804714

The proposed restoration is to stablize the shoreline of the Oakwood lakes, a complex of popular recreational lakes in northwestern Brookings County, South Dakota.

804 715

Examine current state-of-art for greenhouse climatic control using nuclear power plant waste heat for the enhancement of commercial horticulture. Identify through suitable liaison and information exchange, engineering design features of greenhouses and crop growing stations that have resulted from state and federally sponsored waste heat research programs. Select crop species having best commercial potential for growth in these structures when located in New England. Examine state and federal food quality regulations and determine their effect upon the economics of a horticulture operation using waste heat from the condenser of the Vermont Yankee Nuclear Power station. Review plant environmental monitoring records and take such other measurements as may be necessary to determine environmental changes created by the Vermont Yankee boiling water reactor and how such changes might effect an adjacent commercial horticulture operation. Develop an economic and marketing model of a commercial greenhouse, or other appropriate farming technique, whereby waste heat from the Vermont Yankee Nuclear plant condensers is used for crop growth-rate enhancement. The model will include all necessary plant operating parameters, crop specie growth characteristics, New England climatic conditions, New England Marketing variables, and the effects of state and federal food quality control regulations.

804716

1. Objectives: To characterize solid adsorbents for efficiency in trapping airborne pesticides and PCB; to develop a sampler which can be used for routine monitoring of airborne PCB and pesticides

2. Approach: Three sampling trains, consisting of a glass fiber filter followed by two or more adsorbent traps, will be tested under field conditions for their efficiency in collecting pesticides and PCB. The adsorbents tested will include Tenax or Chromasorb 102 resin, polyurethane foam, and a liquid-coated adsorbent. Comparative runs will also be made using a Greenburg-Smith impinger. The individual traps will be analyzed separately to determine the collection efficiency and to establish the breakthrough volume of air.

804 717
Objectives: (1) To devise and evaluate control methods for the imported fire ant utilizing physical, chemical, and biological control techniques whcih will obviate its economic effects. (2) To develop accessory information required to support control methods.

Approach: (1) Development of new control mehtods will involve four strategies:

(a) preventive treatments (b) combination treatments of chemical and physical control methods (c) homeowner treatments using maximum amounts of chemicals on individual mounds and (d) evaluation of fungal, bacterial and protozoan pathogens. (2) Development of accessory information supporting control efforts will be directed toward: (a) identifying food materials fed to and found in winged reproductive forms (b) food transfer from workers to winged reproductives and (c) delineation of tunnel networks and foraging areas.

804718

1. Objectives - To provide an assessment of the present state of knowledge of nitrification and nitrate reduction, to identify those problems in most critical need of solution and to expose promising avenues of research that may contribute to solution of these problems.

2. Approach - The conference will comprise an opening session, morning and evening sessions for two days and a closing session of papers with discussion periods. Time and space for informal interchanges will be provided. Social and Poster session will be conducted to stimulate further discussion.

3. Current plans - Sessions devoted to a) Methods and Microbiology, b) Metabolism and Molecular Biology (two sessions), c) Natural Environments, d) Interrelationships and Controls, and e) Posters are planned.

804719

Objective: To investigate surface stability and salt movement in spent oil shales and soil-covered spent shales after a cover of native vegetation has been established by intensive treatments and then left under natural precipitation conditions.

Approach: The study is being carried out on two different spent oil shales. "Soil" treatments are plant establishment on;1. directly on leached and fertilized spent shales; 2. six inches of soil over leached spent shale; 3. one foot of soil over unleached spent shale; 4. soil. Plots have been established on 25 percent north and south slopes at altitudes of 5700 and 7200 feet in or near the Piceance Basin of Northwestern Colorado. Each plot (28 per site) is bordered with wood to form individual runoff plots 11 feet wide and 22 feet long. Sediment and runoff catchments have yet to be installed. One site (5700') has been instrumented for soil salinity and soil moisture measurements.

A cover of native plant species has been established on the lower altitude site and will be established on the higher site. Measurements on vegetation include frequency, density and vegetative ground cover.

804 723
The objective of this proposed research is to evaluate the applicability of an established gas chromatography technique (Bellar Method) to the analysis of a wide variety of organic compounds that might be found as pollutants in water. The Bellar method utilizes a unit which volatilizes and traps organic compounds, free of water, areinjected into a gas chromatographic unit for analysis. This method, as applied to organic halides, has been found capable of determining organic halides at the ug/l level. This project will focus on those parameters of this gas chromatography technique which can provide the conditions for the development of a reliable and quantitative method of analysis of a wide variety of organic compounds in water. The study will include an analysis or real water samples as well as synthetic samples.

804 724
The two distribution systems of Salem and Beverly would be studied along with their common source by measuring various microbiological, chemical and physical parameters to help determine if certain criteria should be used in measuring water quality. The information obtained would be cross matched to determine if there was a significant correlation between the data gathered. The microbiological tests performed would be the standard plate count, coliform enumeration and identification. The chemical tests would consist of pH and chlorine measurements while the physical parameters of turbidity and temperature would be measured. Special attention would be paid to the relationships between the level of turbidity vs. the standard plate count and the standard plate count vs. coliform count. Also, care would be taken to identify organisms that are able to grow on the media of the standard plate count and coliform test so that it could be determined what organisms are competing for the same nutrients on the plates and in the distribution system. With all the tests and identifications performed it could then be determined, one, how effectively the coliform test is performing; two, whether the turbidity levels affect the general microbial and coliform populations; three, whether the new identification procedures could be used effectively by water laboratories. This basic information could be used to determine whether or not standards should be set and if they should be, then what level should the standards be set at.

804 727

The objectives of this project are (1) to reverse the current eutrophic condition of a major recreational lake through reductions of nutrient input (primarily phosphorous from major tributaries; (2) based on this experience and additional project work to develop informational packages for interested citizens, groups, and agencies, to help them better understand and analyse lake problems and develop and carry out action packages of lake restoration techniques; and (3) to create a nucleus of capability at the state lev el to respond for information and technical assistance in lakes restoration.

The approach to reversing eutrophication is to adapt to a total management solution including application of the following techniques: nutrient inactivation; treatment of waters via sand filter beds; dredging and removal of sediments; drawdown; management of fish populations; citizen education campaigns and programs to reduce excessive fertilization of lawns and use of high phosphate detergents and to repair or replace malfunctioning septic systems.

Efforts at institutional development will include assistance to an existing Lake Cochituate Watershed Association to more effectively carry out the final techniques listed in the last paragraph; based on this effort to prepare a booklet on development of effective lake associations, prepare general informational booklets on general lake problems and restoration techniques; carry out and publicize intensive analysis of selected lakes in Massachusetts (representing different geographic areas and problem conditions), and to develop a state response capacity to needs for technical assistance.

804729.

The pilot dredging project will be undertaken to test the natural rate of settling of dredge material; determine how to best accelerate the natural settling and drying ratio; determine how to convert the dredge material into a valuable resource; and to evaluate the most suitable type of dredge for use in a full-scale project.

804 731

Objectives: To determine if direct addition of powdered activated carbon (PAC) to activated sludge units and changes in operating procedures will significantly improve effluent quality and a-proach Best available Technology. The role of adsorbents in enhancing biological activity will be investigated, along with their ultimate impact on sludge disposal by land application.

Program: An investigation of activated sludge treatment of refinery process wastewaters will be conducted in a laboratory bench-scale systems. Side-by-side studies will be made to: L0 determine role of adsorbents in enhancing biological treatment; and 2) determine the impact of loading variations on system performance. Additional studies will be conducted to: 1) identify hydrocarbon types which resist removal by biological and physical treatment programs evaluated; 2) investigate the ultimate fate of sludges generated by treatment programs in land application techniques; 3) formulate a work plan for full-scale plant evaluation of combined adsorbent-activated sludge treatment based on pilot studies; and 4) develop rough economic assessment of treatment programs investigated.

804732

Interagency agreements and procedures at the State level to promote improved landfill siting processes.

804734

The objective of this work is to determine if the algal-meander system technology which has been successful at removing heavy metals and trace organics from lead mine and mill wastes is applicable to treating secondary lead smelter wastes. In the first phase of the project a variety of heavy metals will be exposed to columns of algae under a variety of physico-chemical conditions to determine their efficiency at removing both cations (Pb, Zn, Cu, Cd, etc)and their associated anions. The second phase of the study will be used to determine whether or not the process is effective at removing trace organics from the waste.

804743

The main objective of the studies is to provide information on the water temperature regimes encountered in eight experimental field channels in which biological experiments are conducted. Heated water is discharged through these channels at low flow velocities. Field measurements of water temperatures and mathematical models are used to achieve the objective. Field data are subjected to statistical and regression analysis to give information on longitudinal water temperature gradients, diurnal water temperature fluctuations, vertical stratification, longitudinal dispersion, and rate of surface heat loss. Correlation with weather parameters will be provided. Soil temperature conditions are also surveyed.

804736

The parameters affecting retention and inactivation of virus in soils will be further defined and evaluated. Guidelines for the prediction of virus pollution of groundwater and other drinking water from recharge will be developed as functions of virus and soil types, the composition of percolation medium, and a variety of organic components, coatings, and biological films.

Viruses representative of the important basic types of animal viruses (glycoprotein-containing and icosahedral types) will be utilized in adsorption experiments of the batch and column types with radioactive measurements of labeled virus and tests for infectivity as indicators of virus movement and inactivation, respectively. Experiments will be conducted with pure reference minerals. reference minerals with organic coatings, biological films mostly consisting of bacterial exopolymer, and sterile and natural soils of several characteristic types.

A number of related factors such as adsorption to organic particulates prior to soil percolation, and complex biological interactions will also be studied.

804748

1. Objectives: Organics in water and sediment will be analyzed. Emphasis will be placed on the development of techniques to fingerprint oil spills in water and other bodies (marine life, sediments) which have been exposed to crude oil and petroleum products. A general method will be developed to distinguish between indigenous hydrocarbons and organics which have been introduced artificially.
2. Approach. High resolution gas chromatography with glass capillary colums and multiple detectors will be used. At least 3 sets of characteristic patterns will be developed for each sample. These will include a general profile (FID) and chromatograms which are produced by a nitrogen sensitive AFID and a sulfur sensitive FPD. The chromatograms will be treated by pattern recognition techniques. Complete separation of critical areas will be accomplished using a dual oven/two dimensional gc with two capillary columns.
3. Current Plans and Progress. A two dimensional gc has been successfully tested. Selected components or groups of substances are switched from the first gc into the second instrument for further resolution. Switching is effected by Dean's switches with off-line solenoid valves. An electrical heating device is presently installed which will allow the temperature of the intermediate trap to be raised from -100°C to +280°C in 20 msec or less.

804749

Ocean-outfall disposal of domestic wastes raises pertinent questions concerning prior treatment and preferred outfall location due to a paucity of factual information and data. To resolve these questions, the research in this project is subsumed under three objectives which are to: (1) characterize the plume mixing zone as it relates to the kinds and subsequent dilution of sewage derived solutes, (2) test methods for the sampling and enumeration of viral pathogens and determine the most appropriate treatment procedure, and (3) evaluate outfall-induced (via particulates and pathogens) responses of sessile invertebrates and other important marine animals. Three outfalls in Dade, Broward and Palm Beach counties are designated for comparative sampling; data and samples evaluated by EPA, Corvallis. The project emphasizes laboratory work to evaluate the acute effects of sewage on marine animals and involves cooperation with other ongoing research relating to outfalls as well as interaction with user groups. An array of 50-200 gallon experimental tanks with metered inputs of sewage and seawater will be utilized for the experimental work on fish and certain invertebrates. State-of-the-art scientific methods and quality-assurance techniques used during the two-year study ensure that objectives are met on schedule and that all results are scientifically supported. The results will be of use in evaluating the performance standards of ocean outfalls as a disposal method.

804750

The proposed research involves the development and testing of an instrument capable of separately measuring the H_2SO_4, and $NH_4HSO_4/(NH_4)_2SO_4$, fractions of ambient aerosols. A commercially available flame photometer will be used for the sulfur detection, and specificity for aerosol sulfur will be achieved by removing sulfur-containing gases in a diffusion tube stripper. Speciation of the aerosol sulfur will be accomplished either by thermal treatment or by a combination of NH_3 addition and thermal treatment. The physical principle underlying the separation is the temperature dependent conversion of the sulfur-containing aerosol to H_2SO_4, SO_3, or SO_2 gases and the removal of these gases from the air stream. Sensitivity in the low $\mu g/m^3$ range will be obtained by digital signal averaging, and zero drift will be controlled by periodic referencing to the instrument zero. The prototype instrument will undergo detailed laboratory and field testing. Such factors as the response to different sulfur containing aerosols and the effects of particle size, humidity and CO_2 concentration will be tested.

804751

The objectives of this project are (a) to determine distributions of unsaturated water flux over space and time as a function of surface input and naturally occurring spatial variability, (b) to express the sensitivity of the results of the first objective to the variation in hydraulic parameters and determine reliability of results, (c) to determine distribution of solute fluxes over space and time as a function of spatial variability and surface inputs and (d) to develop sampling guidelines and/or recommendations for maximum efficiency. Distribution of water and solute fluxes will be calculated using available experimental distributions of soil water parameters and accounting for the spatial variability. Simulations will be by Monte Carlo methods as well as by discretizing input distributions. Moisture regimes considered include redistribution after surface ponding, redistribution after steady uniform intake and for cyclic application of irrigation water.

804754

Restorative Action: Step I, Parker Horn rehabiligation, consists of dilution of the nutrient rich incoming water with water from the Columbia River. Parker Horn will be diluted at the rate of 1070 CFS for two 10 day periods.

804760

The objective of this project is to determine the feasibility of recovering useful salts from the effluent of a power plant using irrigation drainage water as coolant. A novel combination of processes utilized in the coolant cycle provides a possible opportunity to recover calcium sulphate and sodium sulphate economically. The proposed work will involve an experimental determination of the phase diagrams that govern the crystallization of the above salts from typical mixed solutions, under process conditions that are realistic.

804761

The objectives of the project are to determine the quality, quantity, and availability of rural drinking water supplies, an objective mandated to the U.S. Environmental Protection Agency by the Safe Drinking Water Act of 1974. "Quality, quantity, and availability" are being interpreted broadly to include a consideration of institutional factors affecting rural water supply as well as water quality and quantity as determined by standard laboratory tests.

The approach used in completing this research agenda is to engage in three sets of activities: (1) a national statistical assessment that would allow some regional conclusions to be drawn; (2) a series of national and regional studies that would not necessarily be of a statistical sort; and (3) field oriented information-gathering activities to help validate the results of the other research activities and to identify areas where research is needed. These activities comprise Phase One of the Rural Water Survey and will result in two reports to EPA and to the Congress, one in December 1976 and a full report in December 1977. Project plans also include a Phase Two in which a network for continuing research and monitoring of rural water development would be established. Phase Two would be planned during Phase One.

Progress so far includes (1) identification of most of the organizations that will conduct the research; (2) identification of topics to be researched for the First Report in December 1976; and (3) completion of management and financial plans for the entire Phase One of the project.

24

804 762

This is an initial study to determine the applicability of electorstatic precipitators in the nonferrous metals industry. This study will cover the analysis of tests for E.S.P.'s as applied specifically to copper reverberatory furnaces. Additional determinations are included for trace metals and gaseous emissions. The data developed in this study will be incorporated into the data bank for upgrading an existing computer systems E.S.P. model to apply to the nonferrous metals industry.

804763

The detection and location of water levels, water pockets, voids and various other discontinuities between different layers of earth or rock is critical in insuring the performance and safety of earth dams. Such underground anomalies are particularly undersirable in the earth dams and dikes that contain hazardous materials since these relatively small embankments are generally not engineered or constructed in a rigorous and professional manner.

One possible technique for detecting and monitoring such faults and weak areas is the use of microwaves. By beaming continuous or pulsed microwaves at the dike and recording the return signal as it is reflected from the anomaly, the location, type and depth of faults can be determined. A literature search (technical, equipment, legal and safety) will be undertaken and a number of laboratory experiments will be performed to assess the practicality of using microwaves for the non-destructive assessment of dike stability. Basic soil properties such as dielectric constant, conductivity, attenuation, phase shift, and velocity, will also be determined.

The final result of this project will be the detailed specification for a inexpensive, mobile, microwave unit (with known limitations) to determine underground water, irregularities, and discontinuities in small earthen dikes.

804764

"AN Investigation of the Reactions of Aromatic Hydrocarbons in Photochemical Air Pollution.
The primary goal of the study is to identify the intermediate and final products form when aromatic hydrocarbons are irradiated with oxides of nitrogen under simulated atmosphere conditions.

804768

LAKE NOQUEBAY PROTECTION AND REHABILITATION PROJECT
Restoration Plan: Selectively dredging 300,000 cubic yards from those areas where sufficient organic sediment exists to promote growth of water milfoil. Diversion of the inflowing stream in the upper northwestern part of the Lake. Finally, application of an herbicide to control the growth of water milfoil to favor more desirable native plants.

804 770
This project's objectives are to determine the effectiveness of ultraviolet disinfection of filtered and unfiltered secondary wastewater effluent using two commercial pilot units. The relationship between the dosage of ultraviolet radiation and disinfection, the effect of wastewater quality on UV penetration, and the effect of dissolved oxygen, and temperature will be determined and compared to poliovirus and coliform kill. The role of ozone and photoreactivation in ultraviolet disinfection will also be studied.

Both short term controlled studies and one month continuous operation data will be collected. The data will be used to develop basic information on the process as well as design, reliability and cost information for engineering evaluation of the process and equipment.

804773

The purpose of this research is to develop a testing technique to assess the leaching potential of various hazardous waste materials when placed in a sanitary landfill.

In the first phase of the project, a separation technique will be developed by which the liquid portion of hazardous wastes may be removed from solid portions of those wastes. The liquid portion, which is analyzed directly for pollutants, is considered to be that portion of the waste which is immediately available in liquid form to cause pollution problems in a landfill. The solid portion of the waste would produce pollutants only upon the addition of moisture.

The second phase is to develop a testing technique in which the previously separated solid portion is contacted by various leaching media to assess the leaching potential represented by each waste. The leaching media will be developed by comparing the leaching aggressiveness of various leachates from landfills, and selecting a representative formula.

The final phase of the work is to use the standard leaching test to examine the leaching potential for various hazardous wastes to be selected and supplied to the project by EPA.

804 776

The objective of the study is to assess and evaluate the virus and bacteria-removing capabilities of a groundwater recharge system using tertiary treated, chlorinated sewage effluent in order to define its ability to return microbiologically acceptable waters to the aquifer.

Operations will include: (a) routine bi-weekly analyses of system influents and effluents using virus concentration methods followed by enumeration and identification of human virus sp. (Enteroviruses), (b) studies with known numbers of laboratory virus strains added to and traced through the system, (c) studies of virus survival in soil cores taken from recharge site, (d) routine coliform analyses performed with same frequency as routine viral analyses (a).

804 774

Two water supplies containing high levels of arsenic will be chemically characterized and the nature of the arsenic compounds elucidated. These water supplies are to be obtained from Taiwan, where human skin cancer is rather common, and from a location in the U.S. to be determined wheresuch effects have not been observed. A comparison of the chemical compositions and the types of arsenic compounds present in these two water supplies might help to find the carcinogenic material. Standard water analysis techniques will be employed to identify and quantify the dissolved and suspended materials not containing arsenic. Arsentie and arsentie will be determined polarographically. Organic arsenic compounds will be detected and quantitatively estimated by gas chromatographic-mass spectroscopic techniques.

804778

Large farming corporations are currently draining and developing huge areas of wetlands in the North Carolina Tidewater Region for agricultural production. Presently there is insufficient information to evaluate the effects of such massive land changes on the environment. The proposed research will investigate effects of land development on quality and quantity of drainage water from a range or organic soils in this region. Objectives are:

1. To analyze drainage waters from three paired sites on First Colony Farms to determine the effects of land development on water quantity and quality parameters, the seasonal variation of these effects, and the total nutrient and sediment load leaving the area.

2. To analyze drainage water for selected herbicides and insecticides used in the production of corn and soybeans on the organic and high-organic mineral soils of the Tidewater region.

3. To determine the potential for polluting estuarine ecosystems from pesticides used in intensive crop production in the Tidewater region.

4. To evaluate existing hydrologic and nutrient transport models for Tidewater region conditions, to use these models to extrapolate measured effects of land development for standard events such as a 25-year storm and to predict the effects of land development for ungauged watersheds.

5. To determine the effects of land development on water table elevations, seepage to underlying aquifers, and soil subsidence and the variatio

804779

Research is proposed to assess various chemical and biological approaches for removing phenols and chlorophenolic residues from spent chlorination and caustic extraction bleaching liquors. The approach to be used will consist of testing the toxicological effects of various synthesized phenols and chlorophenols typical of the structures found in bleaching effluents as well as the phenolic fractions of the spent liquors themselves on several types of aquatic flora and fauna. In those situations where toxicity effects appear, attempts will be made to reduce or eliminate the effect of the offending phenolic material(s) through the application of chemical and/or biological oxidative treatments.

The test organisms consisting of lower plants (an alga and a yeast) and aquatic invertebrates (Daphnia magna, scuds and crayfish) will be exposed to varying concentrations of the phenolic compounds and fractions and the mortality rate noted. Attempts will be made to de-toxify those phenolic substances exhibiting toxicity through treatment with oxidizing agents such as ozone, oxygen, sodium hypochlorite and chlorine dioxide. Similarly, attempts will be made to identify bacteria, actinomycetes, and fungi capable of effecting the biodegradation of the toxic phenolic materials. to isolate these in pure cultures, and to demonstrate their positive effect on commercial bleach effluent streams.

804780

Using artificially poliovirus-spiked feces, methodology will be developed for extracting the virus and obtaining high titered preparation with low chlorine demand. Major emphasis will be placed on procedures avoiding exposure to pH extremes. Use will be made of non-adsorbing filter membranes, freon extraction, exclusion chromatography and gradient centrifugation. The procedures found to be optimal will be used to yield such preparations from naturally shed virus following immunization with poliovirus vaccine and during the course of occurring wild enterovirus infections. The kinetics of chlorine inactivation of such preparations will be compared with each other and with their tissue culture passaged counterparts.

804781

It is the objective of this project to produce a definitive text or manual dealing in a comprehensive manner with all aspects of individual water supply systems which relate to their quality and potential treatment. It will be written so as to be a ready reference manual to any homeowner or layman in search of complete knowledge about improving the quality of his water supply. It will contain basic language about each subject with adequate introductory sections capable of leading readers to understand even some advanced technology. At the same time the comprehensiveness of the text could lend itself for use as a teaching manual.

A significant number of scientists involved in water treatment will be contacted as contributors and reviewers to the text as will manufacturers of basic treatment equipment. NWWA will utilize its own library as well as all the existing literature on domestic water supply treatment to be found in other libraries. A selected list of subject matter to be covered in the text is as follows:

Hydrologic cycle; Water Chemistry; Sources of Pollution; Water Supply System Construction; Significance of Water Quality Constituents; Sampling; Treatment Techniques for the Removal of Physical Contaminants, Biological Contaminants, and Chemical Contaminants; Treatment for Special Problems; Domestic Water Treatment Equipment; Disposal of Water Treatment Waste Products; and Special Problems and Research Needs.

804 782

Through the Environmental Protection Agency, the federal government is encouraging the adoption and use of new technology in municipal waste treatment. To effectuate realistic technology transfer policies, EPA must better understand the dynamics of local decision-making as they impact on decisions to innovate. Some municipalities have made decisions to incorporate new technology, wheras others have not. Why? To investigate the factors that impinge on technological choice by municipal users, the proposed research would study the process of decision in four cities that have made contrasting technological determinations. It would prepare in-depth case studies using an organizational problem-solving approach. This would involve structuring the analysis around key decision points found to be critical in previous studies in the adoption of new technology: (1) awareness of problem/opportunity; (2) search for alternative solutions; (3) advocacy of options; (4) adoption of specific solution; (5) initial implementation; (6) incorporation or termination. Cross-case comparisons would be made to delineate the roles played by various participants in the process and how coalitions form at the local level that serve to promote or impede the introduction of new technology to municipal waste treatment.

804789

San Luis Obispo, California Resource Recovery Implementation Grant - the purpose of this grant is to financially and technically assists San Luis Obispo to implement a system for the source separation of municipal solid waste.

804791

SPRINGFIELD, ILLINOIS RESOURCE RECOVERY IMPLEMENTATION GRANT
The purpose of this grant is to financially and technically assist Apringfield to implement a municipal solid waste resource recovery system.

804794

There is considerable interest in the evaluation of nonpoint source pollution resulting from the transport of nutrients and pesticides from croplands to surface waters. The watershed drainage characteristics play a significant role in these transport processes, and control measures require an improved understanding of these mechanisms. Where watersheds are artificially drained by tiles or ditch lines, transport mechanisms are as yet too poorly understood to support adequate control measures. It is the purpose of the proposed investigation to remedy this lack by developing a physically-based computer simulation model of nutrient and pesticide transport in artificially drained croplands which will provide the needed understanding of these mechanisms and lead, thereby, to management decisions for minimizing degradation of water quality resulting from fertilizer nutrients and pesticides.

CBNS has collected considerable data regarding nitrogen transport from an artificially drained watershed. Based on these data, we have developed a mechanistic-type model of water movement, nitrogen transformations and transport and plant growth in a tile-drained agricultural field (about 62 hectares in size) in the watershed of the Sangamon River, Ill. Computed results show favorable comparison with historical data. This nitrogen model will provide the framework for the development of the proposed nutrient and pesticide transport model. In the project considerable emphasis will be given to the development of a transferable model so that it can be applied in different regions of the country to study the nutrient and pesticide transport problem without the need for large time-series data collection.

The work plan outline for the proposed project include the following: 1) Improving the predictive capability of the present nitrogen model; 2) Expansion of the nitrogen model to include other nutrients and pesticides; 3) Testing the nutrient and pesticide model in different artificially drained watersheds; 4) Development of a transferable model for nutrient and pesticide transport in artificially drained soil systems.

804799

"RECYCLING AND RESOURCE RECOVERY PLANNER"
The purpose of this grant is to financially and technically assist Nez Perce to implement a source separation of municipal waste system.

804801

CITY OF DULUTH MUNICIPAL SOLID WASTE RESOURCE RECOVERY AND RECYCLING PROGRAM
The purpose of this grant is to financially and technically assist Duluth to implement a municipal solid waste source separation projection.

804804

The intent of this investigative effort is to develop, through pilot plant testing, a comprehensive approach to the management/treatment of septage that will transform this material into one which is chemically, physically, and biologically safe for reintroduction into the natural environment.

Essentially two strategies exist for the proper management and treatment of septage:

1. Utilization of municipal wastewater treatment facilities as a receiver for this material and/or
2. Construction of facilities exclusively for the processing of septage.

Integral to the above will be further definition of the characteristics of untreated septage as well as character transformations resulting from various types of treatment. Investigations on pretreatment, dewatering, resultant aqueous and solids bearing fraction treatment, combined fraction treatment, and combinations of the above are to be undertaken.

The overall outcome of these efforts is to:

1. Define the applicability of utilizing equipment normally found at municipal wastewater treatment facilities for the effective treatment of septage,
2. Optimize operational conditions for such equipment so that cost effective, environmentally sound results may be consistently attained, and
3. Derive design and operational parameters for new management/treatment processes.

804809

The purpose of this grant is to financially and technically assist the State of Rhode Island to implement a resource recovery for municipal solid waste.

804810

The purpose of this grant is to financially and technically assist Middlesex County to implement a municipal solid waste resource recovery system.

804811

The Environmental Protection Agency has recognized the fact that there is, at present, inadequate knowledge of the environmental effects associated with the commercial development of coal gasification. While this problem is being attacked in many ways, there is a definite need for an experimental facility devoted entirely to the identification of potentially harmful effluents from coal conversion processes.

This project is for operation, testing and evaluation of a small pilot plant coal gasifier - gas cleaning facility to be located at North Carolina State University.

The objective of the project is to determine the performance characteristics and the environmental impact of a typical coal gasification and gas cleanup process. The project will identify and trace all potential air and water pollutants from the process.

804812

The objective of this project is the destratification of the Charles River Basin by induced circulation by aeration. This will result in the removal of existing nuisance conditions and hazards and in the general improvement of water quality in the basin. These improvements will in turn result in the enhancement of recreational and aesthetic benefits to the public due to the removal of obnoxious odors, increased fish populations due to better water quality, and a greater assimilative capacity of the basin for pollution loading.

Stratification occurs because of the differences in water densities of the river's fresh water and the salt water intruding from Boston Harbor through the Charles River Dam locks. Salt water stratification prevents vertical mixing and the decomposition of organic material within the deeper zones and has resulted in a complete depletion of oxygen. Hydrogen sulfide is produced in this anaerobic environment by the reduction of sulfates and released to the air at fall and spring "turn-overs" in the basin.

Aerators will be located on the basin bottom which will induce vertical circulation and destratify the basin. The basin will benefit from prevention of hydrogen sulfide build-up and an increase in the dissolved qxygen content.

Camp Dresser and McKee, Inc., consulting engineers, were hired by the M.D.C. to study the problem of salt water intrusion and stratification in the basin. After extensive water quality studies and examination of possible restoration techniques, recommendations were made to destratify the basin's waters by induced circulation by aeration.

804815

The objective of the proposed project is as follows: To reduce the impact of rapid urbanization on the water quality of Jackson Lake. The restoration of Jackson Lake includes the utilization of a combination of settling basins, some of which are already in existance but have not been maintained or otherwise may have to be modified, channel modifications, and establishment of a final high water biofiltration marsh.

804816

At present an estimated 100 power generating facilities are planned for the lower Ohio River Basin. The granting of appropriate Federal permits for these plants constitutes an action requiring an environmental impact statement for these plants on an individual basis, but not for the Basin complex as a whole. The Midwest Energy Facilities Impact Assessment addresses this problem through the assessment of environmental impacts of specific regional technology configurations (RTC's) prescribed for the Basin through the year 2000. The regional technology configurations will be developed during the summer of 1976 by a team of academicians and EPA personnel. Three parallel assessments for each RTC will be made by "first cut" assessment teams drawn from seven major midwestern universities. These assessments will be completed by May of 1977.

804817

This study is a "first-cut" technology assessment, or mini-assessment, of the socioeconomic and environmental impact resulting from additional energy conversion facilities being built in the Lower Ohio River Basin. The principal objectives of this assessment are to assist in the outlining of the full range of policy options for dealing with selected kinds of development, alternative levels of development and their possible undesirable effects; and analyzing the probable impacts that would result from implementing each option in its total framework, with special emphasis on the natural environment and its interrelationship with public health and welfare.

The study will deal with the full range of primary, secondary, and higher order effects of the implementation of new energy conversion and power generation facilities in the Ohio River Basin. The higher order effects may be unintended or unforeseen by the technology's developers, and may be indirect or delayed in nature, but might in the long run, be of greater consequence than the technology's intended primary effect by overriding or even working against that intended effect.

804820

The project will involve development of a generalized model embodying mathematical representations of all important physical, chemical, and biological processes that affect the transport and behavior of pesticides and other toxic organic materials. The model will be implemented for interactive use from remote terminals. Validation will utilize data from microcosms and diverse natural systems. The existing ecosystem model CLEANER will be adapted to represent bioaccumulation and biomagnification and will be linked to the model of toxic organic materials in order to study potential environmental impacts.

-804821

The proposed work will be an impact assessment of the potential social, economic, and environmental impacts of future energy conversion facilities in the Lower Ohio River Basin. The work will be performed by an interdisciplinary team of staff members from the Chicago Circle and Urbana-Champaign campuses of the University of Illinois. The researchers will describe the kinds of impacts that may be anticipated from a variety of Regional Technical Configurations to be defined by the sponsoring agency's management team.

The work will be divided into various subtasks which are in the areas of physical and biological description, the sociological status, information on environmental impacts and control technology applications, institutional factors, preliminary assessment activity, and additional assessment as related to environmental, economic, social and energy impacts.

In addition, special studies by other staff members will be conducted.

804822

The purpose of the proposed project is to work with the Organization for Economic Cooperation and Development (OECD) in developing and implementing improved environmental assessment methodologies which can be utilized by both member and non-member countries. The project can be divided into two parts. The first part will be concerned with developing an international residuals coefficient matrix, similar to one developed previously in the U. S. termed MERES. One short-term object of this task will be to provide the environmental data needed for an international energy model being developed by the International Energy Agency. The second portion of the project will be part of a study being carried out by OECD on the siting of large energy facilities. The specific objective will be to develop a methodology for environmental impact assessment for the siting of large energy facilities, utilizing the residuals coefficient matrix.

804823

Implementation of the plan to provide protection of the water quality of White Clay Lake presents an opportunity to assess the effectiveness of protecting water quality by applying simple sediment and nutrient control measures in an agricultural watershed. Techniques such as clear-water diversion, terracing, contour stripping, better manure handling systems and stream bank protection are useful soil and water conservation practices, but institution of regulations to require application of such techniques on a broad basis should be preceded by an evaluation of their effectiveness for water quality protection.

Major changes in water quality resulting from implementation of conservation practices will be most easily noted in the incoming streams. Continuous monitoring of two streams which drain about 45% of the watershed provides two years of background data on water flows, nitrogen, phosphorus, chloride and sediment transport.

Evaluation of the management plan implementation involves a continuation of current lake and watershed monitoring activities plus some additional work using sediment cores to delineate the history of lake infilling. Additionally, evaluation of the effect which marsh areas have on the quality of water entering the lake will help guide judgments about the preservation of these wetlands for protection of lake water quality.

804827

Objectives:
(1) Integrate a simulation package for evaluating the effects of different irrigation systems and their operation on the movement of water, salt, and nutrients within crop root zones.
(2) Evaluate the sensitivity of these models towards input data and basic consumption in order to determine if applicable to other cases.
(3) Optimize the design and management of irrigation systems for maximum control of salts and nutrients derived from land application of animal wastes.
(4) Verify models with field data.
(5) Formulate recommendations for irrigating lands where animal wastes have been applied.

Approach: Sixty-three large lysimeters will be treated with heavy, medium, and light manure applications and then planted to corn. Irrigation will be applied at three frequencies and at three efficiencies. Data will be collected to define soil chemistries in each lysimeter and then compared to model predictions. Calibrated and verified models will then be applied to conditions elsewhere to formulate general conclusions concerning the application of animal wastes to irrigated cropland.

804828

Objectives: (1) To prepare a comprehensive state-of-the-art summary of information describing the spatial variability in applications of irrigation water through surface, sprinkler, trickle, and subsurface systems.

(2) To code, document, and verify a detailed simulation subprogram of irrigation uniformity to be utilized in conjunction with other hydrologic models, especially with respect to predicting the quantity and quality of irrigation return flows.

Approach: Data from on-going or recently completed studies will be collected along with pertinent information describing irrigation systems. A state-of-the-art summary will be written from which a computer subprogram will be generated. Data will be utilized by the model to verify its predictions and evaluate its sensitivity to imput parameters and basic assumptions. Analysis of results will indicate the tvpe of statistical distribution that best describes irrigation uniformities under various irrigation systems, their management, and local soil, crop, and climatic conditions.

804 829

Objective: To explore the feasibility of using a captive balloon, capable of carrying an ultra lightweight sampling package, to ascertain the concentration and composition of certain solid, liquid, and gaseous emissions from a fossil fuel power palnt. It is anticipated that this sampling scheme would be used to quantify the impact of conditioning on emissions as well as extending mass balance studies and investigating the primary versus secondary aerosol content of stack plumes in areas where periods of rather stable horizontal plume conditions occur.

Technique: A tethered balloon with multiple, sequential particulate samplers will be used to cross-section and profile an isolated power plant plume collecting only solid particulates during this study. Particulate composition and size distribution will be compared with stack samples and plant operating conditions.

Relevance: The fate of emissions from stacks is not well understood. Attempts using aircraft are not feasible at low flying altitudes and in proximity to the power plant stack because of the poor spatial resolution (aircraft velocity), and for safety reasons. Optical techniques, such as the transmissometer, give no meaningful data as to changes in plume composition. An *in situ* sampler can lead to an understanding of how plant operations, e.g., addition of H_2SO_4, lime, etc., can alter emissions with time.

804 830

The objective of the studies to be carried out in the course of this project is to gain a reliable assessment of the potential hazards presented to the public by such contaminants as may be found to leach from PVC and other piping materials used to convey the water supply. The studies are to be conducted in a dynamic system so that the results obtained will more nearly simulate conditions of domestic usage. Recent toxicological evidence indicates that long-term exposures to extremely low levels of such chemical substances as are often present in PVC pipe produce significant changes in the blood, disturbances in the conditional reflex activity and increased chromosomal abberations. Therefore it will be necessary to develop reliable analytical methods which are capable of detecting these substances atthe parts-per-billion level. The influence on the leaching process of such conditions of usage as flow rate, flow characteristics, water temperature, pipe length, history of previous use, pipe diameter, water quality and physical stress will be explored.

804 832

The purpose of this investigation is to determine the parameters controlling virus inactivation in seawater. From results on laboratory studies, we will attempt to develop an equation to predict virus inactivation under different environmental conditions. This virus model will be compared with our model for die-off of *E. coli*, presently being completed.

804833

This proposal provides for the design, construction, and monitoring of a model (less than full scale) air pollution control system at the coal-fired power plant located on the Fairbanks campus of the University of Alaska. The system operates on a direct contact scrubber-condenser. principal. By spraying water down the muzzle of the power plant exhaust stack, counter to the direction of flow of the hot flue-gas, the system is intended to perform the following function:

1) Eliminate, or to a large extent reduce, ice fog (frozen water vapor emissions) from the exhaust stack during winter operation.
2) Remove fly ash and other particulate constituents from flue-gas.
3) Reduce oxides of sulfur and other noxious components of the flue-gas.

A total engineering evaluation of the system will be made, which will consider both its viability as an air pollution system and its impact on the environment.

804835

The reduction of bacteria will be accomplished through the construction of biofiltration ponds designed to treat surface water runoff from storm sewers.

804 846

The Bureau of Land Protection, Department of Environmental Resources is attempting to evaluate the feasibility of using FGD sludges and fly ash to abate acid drainage from abandoned deep mines and to prevent mine subsidence. Scope of the investigation will compile existing data, derive experimental data, study the physical and chemical properties of FGD products, and evaluate the chemical compatibility of the products with the mine environment. The project includes a social-economic analysis, preparation of preliminary engineering parameters for demonstration, and an evaluation of the effectiveness of this concept.

804847

(1) Identify and select environmental problems about which local leaders need more technical information for wise decision-making. (2) Find the technology and adapt it to their needs. (3) Deliver it through selected Oklahoma Cooperative Extension Field agents. (4) Evaluate the technology transfer effort. (5) Share the results of the study, including implications for a national technology transfer capability.

Approach:

The Project is conducted within the structural format of the Oklahoma Cooperative Extension Service, including a "user" advisory committee to identify problems needing attention. The project staff develops the packages and conducts the experimental components of the project. Five Rural Development Agents spend part-time as disseminators. They work with the project staff to polish the packaged materials and with the County Extension Directors to organize appropriate audiences. They make the presentations and solicit feedback for evaluation.

Progress and Future Plans:

The results from two years of experimentation confirm all hypotheses. A national extension vehicle is needed for a variety of non-agricultural information. The Cooperative Extension Service can satisfy much of this need if an adequate budget is provided. The project will now explore the use of other Extension agents as disseminators. The results of the study will be publicized.

804848

This set of studies represents a portion of a multi-institutional policy-oriented technology assessment of the socioeconomic and environmental impacts which might result from a proposed increased concentration of energy conversion facilities within the Ohio River Basin.

Utilizing the best available data bases, these studies will attempt to address the broad-scale environmental, institutional, economic and social effects of various future combinations of energy conversion facilities(i.e., coal-based plants producing synthetic fuels, as well as nuclear and coal-fired electric power generating plants) and their required support facilities (i.e., coal mining, processing and transportation; ash and sludge disposal facilities; nuclear fuel and reactor waste transportation facilities; and energy transportation systems, including electrical power transmission systems) that might be built and operated in this region in the future.

The principal objectives of this assessment are (1) to assist in outlining the full range of policy options for dealing with selected kinds of development, alternative levels of development and their possible undesirable effects, and alternative technological levels of environmental controls; and (2) to analyze the probable impacts that would result from implementing each option in its total framework, with special emphasis on the natural environment and its interrelationship with public health and welfare. The full range of primary, secondary, and higher order effects will be considered.

804849

1) The objective of this study shall be to determine the environmental and socio-economic impacts of energy conversion facilities in the Lower Ohio River Basin.

2) The approach taken is the utilization of an EPA Work Plan which calls for the project to be broken into four component tasks to achieve one technology assessment.

3) Current plans are to arrive at a general determination of impacts on the Basin with a basis in a number of theorized futures. In following years of the program, specific impacts and more detailed designs and recommendations shall occur.

804850

Many local areas in the United States are faced with the problem of cost effective management of numerous small wastewater treatment plants. The Cypress Creek basin, near Houston, in North Harris County, Texas is an example of one of these areas. The objective of this project is to explore the optimum management system consistent with economic and effluent quality requirements through (1) a restructuring of current management and operations,(2) installation of moderate intensive modifications (minimum telemetry with inspection). (3) installation of maximum capital intensive modifications(maximum telemetry with mimimum inspection), or a combiaation therof. The approach to the problem will consist of a detailed analysis of existing data regarding (1) mechanical factors, causes of failures, frequency of failures, etc., (2) personnel factors, operation functions, skills, training, etc., (3) location factors, distances from central operations, special configurations, etc., (4) process factors,configurations, plant condition, effluent quality and quantity, etc., and (5) a cost anaysis. Signifcant factors and relationships will determine system design. Implementation of the design will provide data for optimization.

804851

This set of studies represents a portion of a multi-institutional policy-oriented technology assessment of the socioeconomic and environmental impacts which might result from a proposed increased concentration of energy conversion facilities within the Ohio River Basin.

Utilizing the best available data bases, these studies will attempt to address the broad-scale environmental, institutional, economic and social effects of various future combinations of energy conversion facilities(i.e., coal-based plants producing synthetic fuels, as well as nuclear and coal-fired electric power generating plants) and their required support facilities (i.e., coal mining, processing and transportation; ash and sludge disposal facilities; nuclear fuel and reactor waste transportation facilities; and energy transportation systems, including electrical power transmission systems) that might be built and operated in this region in the future.

The principal objectives of this assessment are (1) to assist in outlining the full range of policy options for dealing with selected kinds of development, alternative levels of development and their possible undesirable effects, and alternative technological levels of environmental controls; and (2) to analyze the probable impacts that would result from implementing each option in its total framework, with special emphasis on the natural environment and its interrelationship with public health and welfare. The full range of primary, secondary, and higher order effects will be considered.

804854

The primary objectives of this investigation are:
1. To establish the feasibility of upgrading existing primary sedimentation plants to meet the secondary treatment requirements of PL 92-500 through the installation of rotating biological contactors (RBC's) in the upper half of existing primary clarifiers and a false floor at mid-depth to form a lower secondary clarification zone.
2. To establish the degree of pretreatment and supplemental oxygen supply (if any) necessary to successfully operate an RBC system in this mode.
3. To evaluate the effects of climatic, diurnal flow, and total daily load variations on process efficiency.
4. To establish design parameters and capital and operating costs for the application of this upgrading technique to maximize the use of existing tankage and facilities at other existing primary sedimentation plants.

Operation of Edgewater's converted primary clarifier test module (0.5 mgd±) over the past 2 years has demonstrated to the Borough the potential of the RBC/false floor concept to upgrade performance to secondary treatment levels. However, the existing installation lacks certain control refinements which are necessary to determine limiting conditions of the process as related to hydraulic and organic loadings and diurnal flow variations. It is the intent of this project to provide for the installation of equipment to accurately monitor and control flow and to efficiently remove grit and trash, to provide for the collection and analysis of flow proportional 24-hour composite samples, and to establish and carry out a systematic procedure for evaluating the primary clarifier/RBC test system over a meaningful range of loading conditions and for optimizing process results. The concept will be analyzed on a cost effective and treatment efficiency basis, especially as to its applicability to similar primary plants throughout the country.

804859

The proposed research symposium on the management of gas and leachate produced from landfills, intends to gather research personnel working on this subject from various parts of USA and other countries for the purpose of research information dissemination. Selected speakers will present prepared papers on various subjects dealing with the symposium topic and the attendees will have ample opportunities to interact with the speakers as well as with themselves. The presented papers will be published as a symposium proceedings which will provide a valuable reference material on the subject.

804 860

The research proposed for this study would utilize a micrometeorological approach to obtain improved estimates of the total amount and time course of the natural emissions of hydrocarbons from the forest vegetation. Micrometeorological measurements, including vertical profiles of various hydrocarbons, will be made in a forested area near Durham, N.C. at the Triangle Site for the International Biological Program (IBP) Project. These measurements will enable us to calculate the vertical flux of these hydorcarbons and thus their emission rate from the forest vegetation. The proposed research will be a cooperative effort involving personnel and instrumentation from both the IBP project and the Gas Kinetics Photochemistry Branch (GKPB) of the EPA Environmental Sciences Research Laboratory.

The measurements will be made for selected sampling days over a six month period beginning in July, 1976. They will provide daily and seasonal time course estimates of the emission of natural hydorcarbons which can be related to both the physiological activity and water status of the forest vegetation and general climatic condiitons. They will give us a better understanding of the importance of vegetation in the production of photochemical smog.

804864

The objectives of this project are: 1) to determine the applicability of the Bellar-Lichtenberg methods for volatile organics analysis (VOA) in water to a variety of types of compounds and 2) to investigate the variations in analytical precision that are induced by modifications in the hardware, software, and sample-handling procedures.

Variables to be investigated include: 1) sample size, container type, and the presence of head space; 2) temperatures and times of storage; 3) methods of sparging samples, trapping efficiencies, and desorption methods; and 4) instrumentation variables such as column packing, column geometry, heating rate, and gas flow rate. Once an optimum procedure for sampling, handling, and analysis has been devised, its applicability to a variety of types of organic compounds will be investigated. Groups of compounds to be studied include ethers, alcohols, mercaptans, amines, esters, nitriles, and a variety of aromatics, including simple, complex, halogenated, and conjugated types.

The project is to be developmental in nature and is designed for a one-year period. The work will be entirely bench-scale experimentation, and the results will be statistically analyzed in an attempt to identify those variables that significantly affect the results of the VOA. This work will identify areas requiring additional research, and hopefully be instrumental in devising a standard method for the sampling, handling and analysis of volatile organic compounds that may possible be in drinking water.

804 865

Because of public health interest in the attachment to marine particles of pathogenic and indicator strains of bacteria, it is important that methods be developed which will quantitatively recover microorganisms from particulate and sedimentary matter. One approach is use of model systems in which we take naturally occuring particulate matter and various types of sediment and sterilize them. To these typical motile, non-,otile, prosthecate, heterotrophic and autotrophic bacteria will be added at concentrations approaching known in situ values. Various chemical (pH, surfactant, nutrient) and physical (shaking, flotation, centrifugation) techniques will be tested for efficiency and reproductibility of recovery techniques. The methods for estimating recovery will encompass traditional plate count procedures as well as epifluorescence, ATP, fluorescent antibody technique and scanning electron microscopy. Field trials will also be run to determine the usefulness, reproducibility and precision of the separation techniques on natural samples.

804866

The feasibility of utilizing in vitro bioassay methodology to detect mutagenic and carcinogenic properties of aquatic pollutants will be tested. A comparison of findings in fish to rat and man will be made. The approach will include activation of procarcinogens with microsomal enzymes of fish, rat and man. Mutagenicity will be tested using bacterial strains. Carcinogen binding studies will be performed in cultured cell lines from fish, rat and man. Finally in vivo testing in fish and rat will be done. The research is intented to lead to improved methodology for detection of water-borne carcinogens.

804 868

The objective of this study is to assess the magnitude and nature of nutrient and sediments entering surface waters of the United States and to prepare a research plan to fill gaps in the state of knowledge of the magnitude and nature of nutrients and sediments entering surface waters. A state of knowledge report will be developed by teams of experienced research workers and applied scientists who will survey the available information, summarize these data in an appropriate form and suggest major gaps in knowledge that require research.

804 869

A recent formal review of the scope, quality, utility and limitations of the prototype version of the Strategic Environmental Assessment System (SEAS) Model under development by EPA concluded that SEAS is a young program with considerable value and worthy of support for maintenance and development in strategically important directions. The research proposed here is an attempt to design and implement applications of a major module - REGION - of SEAS. One purpose of this application is to promote a broad range of verification of the REGION model results and in the process clarify the potential and boundaries of future applications and develop guidelines for strengthening the Region model structure and data base. The potential value of such applications combined with a preliminary assessment by the user community consists in providing an effective means of providing greater use of SEAS by regional agencies and providing the use of an integrated approach, a common data base, and a practical means of generating a coherent dialogue between EPA and regional agencies.

804 878

The objectives of the project are to review, catalog, and brief the state laws, regulations, and other codes that are being used to regulate animal production and/or animal waste management; to assess their impact on the animal production industry; to point out gaps or inconsistencies; and to suggest possible modification on the basis of experiences with different regulations applies to comparable problems in different states.

804880

An experimental study will be carried out at the Northwest Bergen County Sewage Treatment plant to investigate the efficiency of Ultraviolet radiation as an alternative to chlorination. Parameters which will be monitored are dosage (exposure time and U.V. intensity), power, and effluent quality (SS, turbidity, color, organics, absorption, etc.). The principal objectives of the program are:

A. To demonstrate the feasibility of achieving a coliform density of 200 MPN/100 ml by ultraviolet radiation disinfection of a conventional municipal sewage treatment plant effluent.

B. To determine the efficiency on a full scale basis of ultraviolet light disinfection of a secondary treatment plant effluent relative to dosage requirements, power consumption, and effluent water quality requirements.

C. To determine the utility of a full scale untraviolet light disinfection unit in the treatment of a municipal secondary treatment plant effluent relative to operational, maintenance, and environmental requirements.

D. To estimate the capital, operational, and maintenance costs to implement ultraviolet disinfection for municipal treatment plants ranging in size from 0.5 to 100 MGD, and to compare on a cost-effective basis with disinfection by chlorination.

804881

The objective of this grant is to determine the rates and mechanisms of arsenic transformation in a river system. To accomplish this, the authors propose astudy of the Menominee River which is polluted by arsenic from a pesticide manufacturing facility.

804882

The purpose of the study is to determine whether an acceptable virus recovery method specifically applicable to the hard shell claim exists or can be developed for use in evaluating the virus-associated health hazard in man which might result from the consumption of uncooked or steamed hard shall clams harvested from approved waters. An acceptable recovery method would have a proposed precision of ± 20 percent, a sensitivity of 1-2 PFU per 100 grams, and an accuracy of 70 percent. Information will be sought on the usefulness of an enterovirus indicator for assessing health hazards associated with hard shell clams obtained from polluted waters and retail market sources. The study will be coordinated with a Health Effects Research Laboratory program concerned with potential public health problems of bacterial or viral origin in resulting from the ingestion of hard shell clams.

804886

Objective: To provide a tested and working prototype of a buoyed diffusion chamber array for multi-depth environmental exposure of sewage in aquatic environments to be used to follow the rate of decay of fecal indicators and pathogens of human origin.

Approach: Well-agitated Nuclepore membranes permit the free diffusion of solutes through the pores while both retaining bacteria and viruses and minimizing the Nernst layer, plugging and wall growth. The use of these membranes in a submersible translucent chamber allows the total effect of in-situ temperature, sunlight, inorganic and organic solutes to be observed on the test indicators and pathogens.

The deployment of diffusion chambers at three depths allows the effect of the conditions near the surface, near the thermocline and below the thermocline or photic zone to be observed simultaneously, as the buoyed array drifts with the sewage plume in the test area. A closed loop of tubing with a minimal volume between the cells and the surface buoy permits sampling at intervals of choice from a vessel without raising the array.

Current Plans:

The prototype will be tested and refined in Rhode Island waters to meet the specifications of the EPA Health Effects Laboratory at West Kingston.

804888

The primary objective of the proposed research is to determine if an anti-corrosive agent can successfully protect asbestos-cement pipe from deterioration where corrosive water conditions exist. Commercially available zinc orthophosphate compounds will be tested under different water quality conditions. Asbestos fiber counts and physical inspection of the pipe will be used to determine results of the treatment.

804898

1. Objectives: Principal objective is the development of a sensitive, standardized method of determining whether or not Giardia cysts are viable.

2. Approach/Current Plans:
   A. Obtaining a supply of Giardia cysts. Asymptomatic, Giardia-infected hosts will be identified and used as a source of cysts. Human hosts (from the Univ. of Ore. Health Sciences Center) or monkey hosts (Oregon Regional Primate Center) may be used; a supply of dogs is also available.
   B. Purification and concentration of Giardia cysts from fecal matter. Several methods will be tested and the most suitable one adapted. These include the filtration of homogenized fecal suspension through graded (5, 10, 15 μm) nylon screens, and the use of sucrose density gradients.
   C. Determination of cyst viability will be approached in several ways:
      (1) The positive/negative culture method, in which the minimum number of cysts needed to establish a culture is determined.
      (2) Cyst infectivity: development of a suitable animal model. Normal as well as immunosuppressed animals will be tested for this purpose. Preliminary experiments suggest that the immunosuppressed mouse is capable of supporting infections of Giardia recovered from man.
      (3) Quantitated bioluminescence. This method involves determining whether ATP, present in all living cells, is demonstrable and quantifiable in Giardia cysts.

804900

In December 1974 the Safe Drinking Water Act was passed by Congress (P.L. 93-523). The Act required the Environmental Protection Agency to "conduct a survey of the drinking water situation in rural areas." Under a grant contract a research team based at Cornell University will develop a conceptual framework for implementing the national study. The survey will sample users (households) and suppliers. A multi-step, multi-stage stratified area probability sample will yield data descriptive of states, regions and a national profile of water quality, quantity, availability, dependability and affordability. The study is projected over a period of two years (1976-1978). Several R.F.P. contracts will be allocated by E.P.A. to provide data bases on discrete studies. The summary data will be turned over to the research design and analysis group at Cornell for inclusion in a final report. Collaborative working relationships will be maintained with the National Demonstration Water Project in Washington, D.C. and the Universities Council on Water Resources. The latter organization will exercise a review function on the final report prior to its submission to E.P.A.

804901

The objective of this investigation is to demonstrate a process for the removal of PCBs from processing wastewaters now being discharged to rivers or lakes. With the development and demonstration of the subject program, the discharge concentration of PCBs is expected to be reduced to < 1 ppb of PCBs.

The approach to be demonstrated will involve the use of Envirogenics catalyzed metal reduction process. Demonstration of this process at ~ 100 gpm for treatment of the PCB wastewaters is contemplated.

804902

Objectives and Approach:

(a.) To develop a water treatment process using chlorine dioxide as a disinfectant without a resultant production of Trihalomethanes.

(b) To determine if other organic by-products are formed when using chlorine dioxide as a disinfectant.

(c) To remove halogenated organic compounds existing in raw water supplies.

(d) To determine the economic feasibility of using chlorine dioxide and granular carbon in full size water treatment plants.

804 903

The objective of the proposed research is to determine the virus removal or destruction capability of various water treatment processes. The processes to be tested will include conventional physical and chemical treatment processes, as well as disinfection. Particular emphasis will be placed on the viricidal properties of various water disinfectants, including chlorine, chloramine, chlorine dioxide and ozone on naturally occuring virus.

The proposed study will be conducted at the water treatment plant in Lexington, Missouri, utilizing water from the Missouri River. The overall study will consist of three parts. The first part will be a longitudinal study of at least one year to determine the viral content of the influent and finished water from the Lexington water treatment plant. In the second part, an attempt will be made to assess the continued effectiveness of water disinfection processes utilizing Missouri River water which has been presettled (undergone plain sedimentation) or softened by the addition of lime Finally, a pilot plant will be constructed to assess the effect of conventional water treatment processes on the removal of naturally occurring virus. The pilot plant will be a portable, 10 gpm treatment unit providing for chemical addition and mixing, coagulation, sedimentation and filtration.

The treatment responses to be measured will be primarily virological, but will include other conventional or tentative measures of microbiological contamination such as MPN, fecal coliform, total coliform, acid-fast organisms and yeast. Where appropriate, additional samples will be collected for analysis for the formation of chlorinated organic compounds.

4909

The purpose of this project is to prepare a manual of techniques, derived from the paleoecologic literature, on methods of obtaining information about dynamic aspects of molluscan life history from shells. This manual will include a comprehensive bibliography and each technique will be illustrated with examples from the literature. The text will be written so that anyone with a basic knowledge of invert, biology, ecology, and introductory statistics can use the reference to solve field problems.

As a matter of illustration, the techniques used in the maual will be applied to molusc populations associated with two dumping operations; the Newport, Rhode Island Site (mud on sand) and the New Haven, Conn. Site (mud on mud).

804 917

The purpose of this project is to assess the environmental inpact of wastewater contaminants originating from the production of synthetic fuels from coal, and to evaluate alternative wastewater treatment technologies for the control of these contaminants. The project is carried out in several phases over a 5-year period consisting of (a) a literature review andsurvey of pilot- and full-scale coal conversion facilities to identify specific contaminants which might be found in coal processing wastewaters, (b) a study of the biodegradability of selected organic constituents from such wastewaters including an assessment of the aquatic impact of these constituents and biodegradation products, (c) biological and physical-chemical treatability studies of selected organic constituents and identification of the residuals following treatment, (d) animal toxicology studies to evaluate the potential health effects of those wastewater components for which sufficient information is not available in the literature, (e) treatability studies of composite synthetic and real coal-processing waters including analytical characterization and aquatic impact assessment of the treated waters, and (f) development of design criteria for continuous treatment of wastewaters from coal-conversion facilities.

804 918

This project will measure the effectiveness of several bioassay procedures and chemical tests for defining quality of harbor sediments subject to removal by dredging. Results of chemical tests for concentration of volatile solids, COD, total Kjeldahl Nitrogen oil and rease, PCB's selected pesticides and polynuclear aromatic hydrocarbons in harbor sediments and/or their interstitial waters will be determined and related to the following:

1. Concentration of metals and organic pollutants in Chironomidae removed from the sediments.
2. Cough response of bluegill sunfish in bioassays using sediment interstitial waters.
3. Survival of Daphnia sp. in bioassays with sediment and surficial waters.
4. Behavior and survival of Hexagenia sp. in harbor sediments.
5. Bioaccumulation potential, as defined by the lipid/water partition coefficient of organic chemicals in interstitial water will be defined from relationships to concentration in Chironomidae.
6. Activity of enzymes in sediment interstitial waters.

The project will provide several reliable and inexpensive short-term tests for accurately defining the pollution status of potential harbor dredge materials.

804920

Special terrestrial microcosms were built in order to study the ecological and biological effects as well as the interaction of pesticides in a soil-plant and animal ecosystem. The major objectives are to study:

1. The biological effects and interactions of pesticides on plants grown in these microcosms as affected by a number of environmental conditions such as rain, temperature, air humidities, plant pathogens, soil types, and the presence of residues of different groups of pesticides in the soil.

2. The fate of a ^{14}C-insecticide in the soil of the terrestrial part of the microcosm as affected by various environmental conditions.

3. The qualitative and quantitative composition of run-off water from the soil.

4. The effect of pesticide contaminated run-off soil water on biological systems in water as affected by various environmental conditions.

804 921

A systematic development of numerical models capable of examining the effects of halogenated gases on stratospheric photochemistry and the earth's ozone balance will be undertaken. Because the industrial halogenated gases have their origin at the surface, this research will also be concerned with the fate of these gases in the troposphere. To accomplish this goal, it is improtant to simulate atmospheric processes as realistically as possible. Therefore, the model should be designed such that exchange mechanisms in the planetary boundary layer, as well as between the troposphere and stratosphere can be properly simulated. The first step of this modeling effort will be the design and examination of the results of a one-dimensional, time dependent model. Eventually two- and three-dimensional models incorporating realistic boundary conditions will be developed.

Using the best available chemical kinetic data, a detailed examination of the formation of intermediate halogenated gases which may or may not be removed from the troposphere by heterogeneous processes will be conducted. To obtain a measure of the efficiency of these processes, the numerical simulations will be compared to measurements of the various halogenated gases in the atmosphere.

804922

The Science Information Services Department of The Franklin Institute Research Laboratories will prepare a monthly publication entitled Municipal Technology Bulletin, Vol. 4, provide input to the Water Resources Scientific Information Center (WRSIC) Data Service, and prepare camera-ready copy of all abstracted and indexed documents processed to the Project Officer. By continuously surveying the United States' and foreign technical literature and maintaining close liaison with various research organizations in areas of municipal wastewater pollution control, SIS will emphasize the following subject areas: urban runoff and sewers, tunnel technology, patents, treatment methods, analytical techniques, hydrology, and model studies.

R 804925-01-0

EFFECTIVENESS OF SOIL AND WATER CONSERVATION PRACTICES FOR POLLUTION CONTROL

Classical erosion control methods used for non-irrigated agriculture will be evaluated for their effectiveness in nonpoirt source pollution control. Economic studies to develop associated costs will also be completed.

804 931

A biological phosphorus removal process will be evaluated at a scale of 75,000m^3/d. The key unit process is an anoxic stripper tank which has been engineered to provide counter current movement of return sludge past phosphorus lean secondary effluent. Once operational controls are stablized the process will be operated for 18 months to collect reliability data with changing influent and temperature extremes.

Sludge studies will be conducted on a pilot plant scale. Both biological and chemical sludges, as well as mixtures of the two, will be investigated as regards anaerobic digestion, dewatering and filterability.

Economic projection for instituting the process at various size treatment facilities will be made.

804932

SIMS: During 1976 SIMS will continue to coordinate the Study as outlined in the Proposal (February 1976). This coordination will in part consist of ensuring communication between the Review Panel and the centers at Columbia and Stanford; it will also consist of ensuring direct communication between the two centers in the form of both personal visitations by members of the Study and seminars as appropriate. As soon as any technical reports and papers are produced as a result of the Study, SIMS will see that there is suitable distribution.

Columbia: The first steps will be taken towards the construction of a doubly stochastic Poisson process as a model for mortality and morbidity data in which the rate parameter is itself a random variable depending on time, weather, and pollution.

Research will begin to develop sounder statistical methods than so far employed for detecting geographic areas in which there is nonrandom clustering of cases of a certain disorder, with proper control for such factors as size of population, proximity to treatment facilities, and utilization of those facilities.

Principal components analysis for individual pollutants will begin of correlations, covariances, and raw cross-products between readings from the 40 monitoring stations in the New York City aerometric network.

Stanford: During the first year, research will include the following: The effects of time averaging on the distribution of pollutant concentration maxima; the relevance of probabilistic assumptions to the estimation of spatial pollutant distributions; the relation between spatial air pollution patterns and spatial health and mortality statistics; a retrospective look at the effects of the 1974 fuel crisis on air pollution and mortality statistics.

804933

Two prototype symposia on air pollution and health effects will be planned and presented (a) in conjunction with an annual meeting of a state medical society, and (b) for a meeting of a county (metropolitan) medical society. Objectives include (a) evaluation of symposia for effectiveness and utilization in other states and sections of the U.S.; (b) to stimulate and encourage scientific investigation and encourage continuing research of effects of air pollution on human health; (c) to present and publicize research findings and their application to medical care, preventive aspects, and corrective measures; (d) to motivate cooperative action among medical societies, allied health groups, governmental agencies in meeting environmental protection needs; (e) to stimulate medical society and physician participation in minimizing the health consequences of air pollution; and (f) to communicate to the public the health effects of contaminants and pollutants in the environment.

The approach is to utilize two consultants to assist AMA staff in developing the symposia; the medical societies selected will be invited to co-sponsor the programs. Programs will be designed to meet Category I accreditation toward the AMA's Physician Recognition Award in Continuing Medical Education. Advance written manuscripts will be requested, reproduced and distributed at the time of each symposium. Manuscripts are also submitted for consideration for publication in the AMA scientific publications. Symposia papers will be assembled in binder covers (50 sets) for the EPA libraries.

AMA staff will schedule and implement the administrative requirements to support and present the symposia.

804937

The objective of this project is to provide kinetic experimental data for the development of a mechanistic submodel to describe the decomposition and nutrient regeneration of algal blooms in natural waters. To accomplish this goal involves the determination of the rate of aerobic decomposition of phytoplankton as a function algal species, the physiological characteristics of the algal population, distinguishing characteristics of the decomposer population, and the light and temperature regime. The phosphorus and nitrogendynamics associated with the process of decay of algae will also be investigated. Finally, the significance of microbial decomposer populations in causing the decline of algal blooms in lakes will be studied.

Both laboratory and field work will be employed in meeting the above objectives. The laboratory studies will include the use of: (1) two-stag chemostats (one in light and one in dark) to simulate the two regions in a water column in which either phytoplankton growth or decay predominates, and (2) a culture apparatus which allows the culture of different microorganism populations in the same liquid medium without cross-contamination in order to measure gross nutrient regeneration.. Field studies will consist of closely monitoring the phytoplankton-nutrient dynamics in situ enclosures spiked daily with P and N.

804938

We propose to investigate in fresh-water and marine phytoplankton the effects and fate of selected, stable organic compounds produced during chlorination of sewage effluents. The specific objectives of the investigation are as follows: 1) To study the effect of selected sewage-effluent chlorination products on the growth of fresh-water and marine phytoplankton; 2) To study the interaction among the test chemicals by examining the effect of one chemical in the presence of the other chemicals; 3) To study the effect of nutrient levels on the toxicity of the test chemicals to the phytoplankton; 4) To study the uptake of the test chemicals by fresh-water and marine phytoplankton; and 5) To study the metabolism of the test chemicals by the phytoplankton.

^{14}C-labeled test chemicals will be used to investigate their uptake and metabolism by the phytoplankton. The fate of the ^{14}C-chemicals will be determined by analyzing the medium and the organisms for the parent compound and the products which may result from its transformation. The metabolites will be detected by thin-layer, paper- and gas-liquid chromatography. The identity of the metabolites will be confirmed by combined GLC-mass spectrometry.

804940

The objectives of this research will be to determine the behavior of t ecologically important pesticides in sediments and wetlands under a wide ra of oxidation-reduction, pH and salinity conditions. The study will be carri out by incubating pesticide-treated sediments collected from important watersheds under controlled oxidation-reduction, pH and salinity conditions in th laboratory and determining the effect of these variables on degradation and ot reactions of the pesticides.

804 943
The objective of this project is to obtain actual operating and cost data from a large scale industrial application of "PACT"(1) technology. Data will be gathered from a $43,000,000 wastewater treatment plant being constructed at the Du Pont Chambers Works to treat 26,000 GPM colored industrial wastewater. Neutralized effluent from the primary treatment section of the plant will be contacted with 100 to 200 ppm powdered activated carbon and fed to three 4,000,000 gallon aerators in parallel containing recycled activated sludge.

The "PACT" combined carbon and biological treatment will remove over 90% of the wastewater BOD as well as non-biodegradable, but carbon adsorbable organics. Toxic substances and color will also be reduced. Wastewater quality will permit Chambers Works total plant effluent to meet all effluent limitations in the plant's NPDES permit.

This continuation grant will cover the initial year's experience with start-up and operation of the wastewater treatment plant. Plant construction was generally completed by November 1976 and a lengthy start-up procedure commenced. It is expected the plant will be operating at full capacity by May, 1977.

804944

The objectives of this project are: (a) to formulate equilibrium models for selected trace metals and hazardous organic materials in three representative areas of interest in the Great Lakes; (b) to evaluate past and present field sampling programs and to test the equilibrium models with available field data; (c) to identify any specific analytical and thermodynamic deficiencies which limit the applicability of the equilibrium models and to identify any major kinetic processes which negate the equilibrium approach and thus require further characterization; and (d) to perform appropriate analytical, thermodynamic, and kinetic experiments to meet the identified deficiencies and to provide a base for predictive modeling of hazardous substances and sediments in the Great Lakes.

The three representative regions will be (a) a polluted area such as Saginaw Bay, (b) an anoxic area such as the hypolimnion-sediment system in the Central Basin of Lake Erie in the summer, and (c) a relatively unpolluted region such as the deepwater areas of Lake Michigan. Inputs and outputs will be considered and particular emphasis will be placed on sediment-water interactions. Hazardous substances to be considered include Cd, Zn, Cu, Pb, Ni, and selected polychlorinated biphenyls and polynuclear aromatics.

804 946

The City of Marlborough will demonstate the applicability of ozone generated from an electron beam accelerator (EBA) to disinfect nitrified wastewater.

The EBA will undergo an evaluation to establish the power required to generate ozone. A recycle gas stream will be utilized to obtain higher concentrations of ozone in the gas system. A bubble diffuser will be evaluated to determine the mass-transfer of ozone from the gas stream to the wastewater, and the ozone requirements necessary to achieve a disinfection level of 200 fecal coliforms per 100 milliliters. The reliability of ozone disinfection will be compared with the reliability of the existing chlorination facility at the treatment plant. An engineering and cost evaluation will be made to compare the treatment costs of ozone with chlorine. A projection of capital and operating costs for ozone, generated by an EBA, will be made at various design flows.

804947

I. The objective of the proposed work is to determine what criteria may be used to effectively define the uppermost landward limit of characteristic tidal marshes within the Central Atlantic Coastal Region of the United States. The work will utilize certain findings of previous research efforts, including field investigations relating wetlands plant distributions to tidal datum elevations, and attempt to achieve:

1.) A demarcation of tidal marsh-uplands boundaries for jurisdictional purposes,
2.) The identification of reliable methods and procedures for precise, unequivocable location of the marsh boundary over a wide region.

II. The approach is to conduct a series of systematic field surveys at selected coastal marsh sites within the Central Atlantic Region to include:

1.) Botanical surveys of wetlands floral distributions in the horizontal and vertical directions,
2.) Limit recognition criteria within the marsh-uplands transition zone,
3.) Leveling and elevational sampling of marsh upper limits in relation to a tidal datum plane (Mean High Water).

The surveys will conform to a predetermined experimental design plan which will allow statistical evaluation of various contributing factors (regional location, marsh vegetative type, salinity regime, tidal range) using analysis of variance techniques.

III. The project, if funded, will require one year to complete.

804 951

The objectives of this seminar are to describe in one place the current applications of membrane separations and the developments that indicate trends for the future. It is important that this technology be properly assessed by governmental regulatory agencies as well as by industrialists and those responsible for public services. The results of laboratory, pilot, and full scale evaluations in a wide range of application areas will be presented. The participation of equipment vendors will provide the most current information on practical availability of this advanced treatment and process technology.

804953

A computerized data base dealing with toxicity and bioaccumulation of compounds along with relevant physical parameters will be established. Subsequently, this data base will be used to determine correlations among the physical parameters of the compounds and their toxicity and bioaccumulation. Such correlation studies will allow development of a model to predict toxicity and bioaccumulation of other compounds not in the data base.

804 955

This is a study of the performance of electrostatic precipitators for the control of particulate emissions from non-ferrous metallurgical smelter, roasters, and furnaces in zinc, lead, copper, and aluminum plants.

The study includes the characterization of airborne emissions from these operations and the preparation of a manual that can be used as a guide for the selection and improvement of control equipment.

Detailed data are to be obtained from operating installations on mass loadings, particle size distribution, and trace metal and gas concentrations. These data are to be combined with laboratory measurements of electrical resistivity of collected particulate matter and with operating data on the electrostatic precipitator control equipment. The information will be used in the analysis of precipitator performance by means of a computer model.

The project also includes the development of improved methods for sampling and analysis of effluent gases from emtallurgical operations, especially methods of eliminating interferences from chemical reactions during sampling.

804957

The objectives of this project are: (1) to complete a state-of-the-art review on the methodological and analytical techniques used to evaluate and quantify the economic impact of different factors, natural and man-made, on agricultural crop yields, (2) to evaluate critically these methodological and analytical techniques, and suggest areas where additional research is needed, (3) to assess the quality and adequacy of these methodologies and techniques when applied to economic impact analysis.

The main approach for this project is through literature search and interviewing experts in the field.

This project is to be initiated in August, 1976, and will be completed within four months.

804959

In order to study the effect of carbon monoxide (CO) as an atmospheric pollutant on the development of and the physiologic responses to atherosclerosis, two models in swine will be used. In one model, coronary atherosclerosis will be induced by balloon denudation of coronary endothelium and a high fat, high cholesterol diet. The effect of carbon monoxide and platelet function on the development of the atherosclerotic lesion will be assessed a) by exposing swine to CO to attain elevated HbCO levels and b) by comparing the atherosclerotic response in normal and von Willebrand's disease swine. The response of atherosclerotic swine to stress (aortic cross clamping, anesthesia) and CO exposure will be assessed. In the other model, the effect of carbon monoxide alone in inducing pre-atherosclerotic lesions will be determined. A new procedure for studying the effect of platelet-associated von Willebrand factor in such early lesions of atherosclerosis will be applied.

804 963

Objectives: To determine the pattern of vegetation in the transition zone between intertidal marsh and upland vegetation in Oregon and Washington with the ultimate goal of providing substantive data upon which guidelines for the specification of coastal wetlands may be based.

Approach: Approximately 15 marshes in coastal estuaries and the Puget Sound will be selected based on a classification and criteria developed in the project. Selected marshes will be sampled floristically using line transects in order to determine marsh zonation patterns. The transition zone will be characterized by floristic analysis including, but not limited to, ordination and Braun-Blanquet tabular analysis. Vegetation criteria for defining the upper and lower boundaries of thetransition zone will be developed and will be validated by application to other intertidal marshes in Oregon and Washington. Selected environmental measures will be taken including salinity and substrate texture. Coordination with the National Ocean Survey, providing leveling to datums, and with the Environmental Protection Agency Remote Sensing program will extend the value of this research.

Current Plans/Progress: Pilot research in defining upper limit of marsh in four Oregon intertidal marshes is underway. Proposed research will take 18 months and involve the principal investigation and three assistants.

804 964

The major objective is to quantify the transition zone of vegetation between coastal marshes and their adjacent upland communities in California. By gradient analysis the transition zone will be compared both north to south and from ocean to inland sites in the State.

The approach will be to run transects across the transition zone, noting species abundance and cover at appropriate intervals. Analyses will be made in an attempt to determine recognizable plant assemblages that are indicative of the transition zone.

Current plans include site selection, literature review and planning sessions.

804865

The primary objective of this project is to develop a comprehensive picture of vegetation and flora along selected transects from the tidal zone through the coastal wetlands to the uplands in the Gulf of Alaska. From this very large region we will select a number of different sites that will reflect regional diversity and provide a test of the hypothesis that floristic data will aid the preparation of more precise definitions of coastal wetlands. Ground photography, plant sampling along transects, and the preparation of plant collections will provide the data base. Individual taxa and combinations of taxa exclusive to wetlands will be sought with special attention to the definition of the limits of the wetland-upland transition zone.

804 967

A bioassay for evaluating the effects of dumping dredge spoils will be developed. A "micrcosm" of benthic invertebrates is established in a 251 container with sediment from its habitat. The survival of the component species following burial under various depths of introduced material. Tests will be made with 1) natural sediment 2) sediment of different particle size. 3) polluted sediment. Results of these experiments will be correlated with data from past and ongoing dredge studies.

804 968

Objectives: To hold a symposium or open forum on environmental conservation in petroleum refining which is jointly sponsored by the EPA, the API, the NPRA, and Tulsa University.

Approach: The proposed symposium involves: (1) engaging nationally-known experts to serve as speakers; (2) advertising symposium with EPA,API,and NPRA help; (3) preparing proceedings of all presentations and discussions and mailing same to all participants; (4) editing preprints and discussion into book form for publication

Current Plans: The following progress has already been achieved: (1) API and NPRA have agreed to co-sponsor and help advertise the open forum; (2) tentative outline has veen established; (3) several excellant speakers have been contacted.

804970

This project will evaluate the efficacy of using coprostanol, a fecal sterol, as an indicator of fecal pollution in water samples from seawater bathing beaches. A technique using amberlite XAD-2 resin (Wun, C.K., Walker, R. W. and Litsky, W., 1976. Water Research, in press) will be adapted for the study of seawater samples. This resin will be used to concentrate this sterol prior to quantitation by GLC.

R 804971-01-0

COMPREHENSIVE PACKAGE FOR SIMULATION OF WATERSHED HYDROLOGY AND WATER QUALITY
A continuous simulation model for evaluating waste management alternatives on a basin scale will be developed. The model will be modularized to facilitate incorporation of alternate submodels which describe the dynamics of watershed, rivers, and reservoirs.

804 976

A study designed to develop a model system approach to analysis of biocide effects, especially those of Guthion and other organophosphorus pesticides, in ecologically diverse localities in South Louisiana. Primary objective is to establish means of alleviating land use conflicts between chemical discharges from agriculture and wetland productivity. Phases of the study involve laboratory analyses of target compound stability under diverse physical, chemical, and micorbial conditions and field investigations of organophosphorus chemical behavior, including runoff patterns, breakdown and bioaccumulation in the affected areas.

804 978

Fluidized combustion is a promising new method of coal utilization as it can satisfy both the fuel conservation and environmental requirements of coal combustion.

NO emission from fluidized combustion is generally lower than from other types of coal burning systems. There is, however, potential for further reducing NO emissions by understanding better the processes of NO formation and destruction in the fluidized bed and by bringing this information to the stage where it can be applied for the development of new control technology.

The objectives and the approach of the research respectively are:
to develop a mechanistic mathematical model for the prediction of NO emission from coal burning fluidized beds both at atmospheric and at elevated pressures

to provide physical-chemical input parameters forthe model on the NO formation destruction processes by carrying out a detailed experimental investigation using a 30 x 30 cm pilot plant size fluidized combustor, a 10 cm dia bench scale combustor capable of operating at pressures up to 10 atm and a 7.5 cm dia externally heated bed for the batch type experimental study of the chemical kinetics

to provide information leading to the development of new control technology from the experimental study on the 30 x 30 cm atmospheric pressure fluidized combustor and by using the mechanistic model of the combustion-NO emission processes

to test the mathematical model severely over sufficiently wide ranges of significant operating variables by the comparison of predicted data with results of experimental studies in which spatial distributions of species concentrations are determined both in the 30 x 30 cm atmospheric and the 10 cm pressurized combustors.

804 979

The overall purpose of the project is to evaluate the long term effects of spray irrigation of treated municipal sewage effluent and liquid digested sludge on the forest ecosystems. Several forested areas which have received applications of wastewater for a period of 15 years will be used in the study. Specific emphasis will be placed on evaluating renovation efficiency over time, effect on chemical properties of the soil, effect on forest ecosystem stability, ultimate fate of elements applied to the forest and rate of ecosystem recovery following wastewater overloading.

804981

[illegible]

The purpose of this project is to establish criteria that identify, by means of vegetation, the upper limit of wetlands contiguous with the upper Great Lakes. These criteria will be established from the results of sampling with transects across the ecotone between wetland and upland vegetation and by noting the presence and abundance of indicator species. The study will begin in December 1976 and will be completed in February, 1978.

804 988
Holcomb Research Institute, Butler University, Indianapolis, Indiana in collaboration with th e Technology Transfer Program of the United States Environmental Protection Agency will present a conference on PLANNING ALTERNATIVES FOR MUNICIPAL WATER SYSTEMS October 10-14, 1976 at French Lick, Indiana. The four-day conference is intended to provide a state-of-the-art review of topics improtant in municipal water planning including: water planning considerations, water quality considerations, water quantity considerations, management alternatives (including pricing, pulbicity, improved efficiency and reuse) and public acceptance of alternatives.

Nineteen nationally recognized speakers will make presentation on subjects of interest to individuals engaged in planning, management, engineering, economics and law. Participants will be drawn from universities, consulting firms, government agencies and utilities. To promote exchange of ideas among various desciplines, ample time will be allowed for discussion and informal contact between speakers and participants.

A background brochure providing a brief review of topics and issues to be discussed at the conference will be prepared for conference participants by the Holcomb Research Institute. Proceedings of the conference will also be published.

804 990

This is a proposal requesting support for the further development and application of multiple atmospheric tracer techniques.

The analytical approach is to extend the use of electron capture gas chromatography. Recently, with the helpful suggestions given to us by Ray Dixon, we have developed systems whichseparate SF_6CBrF_3, CCl_2F_2, O_2, and CBr_2F_2 into sharp distinct peaks, the last of which elutes within 200 seconds from the time of injection. The rest of the system development is to develop the capability to accurately analyze at least 1000 air samples per day.

The first extended application of this multiple tracer technique would be to determine the transport and extent of dispersion associated with: (1) urban sources (emitted at low levels) and (2) rural power plant plumes emitted at high levels. Specific experiments are planned to accurately determine the extent of vertical dispersion associated with plumes traveling over rural regions and over urban regions.

804 991

The object of this proposed program is to demonstrate whether chlorine, ozone and ultraviolet light are effective under actual operating conditions in achieving natural virus inactivation in secondary and advanced wastewater treatment plant effluents.

The field program will be carried out over a period of one year at four different wastewater treatment plant locations. Concomitant runs will be made during each operating day; one sampling prior to disinfection and the other subsequent to disinfection.

An AQUELLA^{tm} virus concentrator will be used to process all samples and retain the natural viruses present in the sample. Reconcentrations will be made in the field, the concentrate frozen and shipped to an isolated laboratory for assay. Seeding runs will be made for control. A total of 168 samples will be taken.

804 993

A program directed at determining the factors outlined below will provide the basic information needed to make decisions regarding Kepone contamination in the Chesapeake Bay region or in similar locations in other areas. In addition, the information developed in this study combined with data from ongoing monitoring projects within the State and with research data being developed by EPA will provide the data base for the development and verification of an ecosystem model. More specifically, the program will study the following aspects:

(1) The distribution of Kepone in bottom sediments of the James will be determined

(2) The routes of sediment transport below Hopewell will be delineated.

(3) Major sediment sinks will be located and the rates of sediment deposition at these sites will be determined.

The size, location and mobility of the Kepone resevoir in the James can be determined from this information.

(4) The effect of varying environmental conditions of pH and salinity on release of Kepone from sediments will be determined

This data will provide estimates of whether Kepone absorbed to sediments is released to the aqueous phase as the sediments are moved downstream into areas of higher pH and salinity.

(5) The ability of filter feeding organisms to concentrate Kepone from contaminated sediments will be determined.

Data from this study will provide for a determination of the potential hazards which dredging poses to a variety of filter feeding organisms.

804 994

The project's objectives are to improve the Koh-Chang dispersion model and to simplify its application to dredged material disposal questions. Improvements to the model will focus on the application of recently developed descriptions of the behavior of dumped dredged materials. These descriptions include photographic data from tank tests and field observations of dumping events. Simplyfying the use of the model will include changes in input requirements and instructions for gneerating inputs through field and laboratory work.

The approach to improving the model will involve a phased, iterative procedure in which the model's output is compared to real data. Each such comparison will result in needed changes to the model, followed by more comparisons. Tank data will initially be used, and when the model adequately compares with a variety of conditions in test tanks, the same procedure will be used with field data as the basis for verification and adjustment.

To simplify the use of the model, experience with sensitivity analyses will be used to eliminate some inputs or to build values for them into the program, rather than requiring the user to specify a large number of parameters. For those inputs which are important to be specified for each model use, a guide to field and laboratory testing will be provided. This guide will enable input values to be generated, based on dredged material properties, dumping methods, and hydrographic conditions at the disposal site.

804 996

The relationships between toxicity to biota and metal forms in natural water will be investigated. Published toxicity data will be reevaluated in terms of chemical models based upon calculated concentrations of actual species present rather than upon total concentration of contaminants as is now the case. This will allow for the setting of more precise, realistic limits on contaminant levels which would reduce economic hardships to government and industry in cases where it can be shown that the particular chemical species present have little or no correlation with toxicity.

804997

This proposal outlines work on the effect of a heated water effluent on movement patterns of yellow perch (Perca flavescens). The study will be conducted in the vicinity of the discharge channel of the Clay-Boswell power plant, Cohasset, Minnesota. Miniature radio transmitters will be attached to not more than 60 individuals downstream from the discharge and the movements will be traced through the fall of 1976. The primary objective centers on determining if the heated water acts as an attractant and the fish concentrate in the effluent as the surrounding waters cool.

804 998

(1) Objectives - (i) to establish, if possible, optimu, analytical procedures for the routine analysis of rainwater for acidity; (ii) plan the preparation of standard samples for use by international cooperating laboratories to insure uniform procedural reliability in the determination of trace elements and acidity in rainwater.

(2) Approach - (i) compare proposed methods in the laboratory; (ii) try solutions of various salts and acids on the basis of theoretical compatibility.

(3) Current Plans - Start 1 Oct. 1976 to do (2).

805 002

The proposed study will investigate treatment technologies for a typical dye wastewater. Wet oxidation and ozonation will be investigated as pretreatment steps for rendering refractory dye waste constituents amenable to subsequent treatment by biological, activated carbon, and combined biological - activated carbon systems. Optimum design criteria will be developed for each of the pretreatment steps and for each of the subsequent treatment systems.

Analyses will be made for selected toxic compounds across each of the pretreatment steps and across each of the treatment systems to determine the removal of toxic substances and to investigate the possibility of producing toxic substances in each unit process.

805003

That infectious agents are emitted into the atmosphere during the aeration phase of sewage treatment is well established in the literature, but it is not well documented that the viable particle emissions are hazardous to the health of persons residing near the plant site. This study will determine whether or not the health of persons residing adjacent to a sewage treatment plant is significantly different from persons living more distant from the plant site. Field and laboratory studies to evaluate health status will include: 1) a health questionnaire survey; 2) a health watch survey; and 3) examination of school absenteeism records.

These results will be correlated with analyses of air samples and meteorological data collected at the plant and in the community to determine the nature and distribution of the exposure in the community to viable and non-viable particles and gases emitted during sewage treatment. Monitoring non-viable particles and gases is included to determine if they have a role in altering the susceptibility of the exposed population to infections in addition to their direct noxious effects on man.

805005

In the immediate area of Tampa Bay three advanced waste treatment plants are in operation. These plants must produce an effluent with the following residual concentrations BOD_5 5 mg/L, SS 5 mg/L, TP 1 mg/L, TN 3 mg/L. The plants are Hillsborough County's River Oaks Plant (12,000 m^3/d, design) and Florida Cities two plants of Gulf Gate (7,000m^3/d, design) and South Gate (5,000 m^3d, design).

The interaction of laboratory control analyses as applied to plant operation will be evaluated in regard to reliability of operation and meeting target residuals.

All three plants employ multi-stage biological processes with superimposed chemical additions for nitrogen and phosphorus removal. The two Florida Cities plants employ bio dises for second stage nitrification, while the Hillsborough County plant utilized second stage suspended growth nitrification.

805007

Objectives: Consultation on designs of research analysis of aquatic research data, including evaluation and interpretation or research results when required. Approach: The approach is mathematical/statistical accompained by appropriate graphic representation. Progress: Certain preliminary pilot statistical programs have been tested and the results are on file at the Gulf Breeze Environmental Research Laboratory, Bears Bluff Field Station, P.O. Box 368, Johns Island, South Carolina. Current plans: Proceed, as required; designs of experiments, further development of statistical methods, data analysis, evaluation and interpretation of results, as needed.

805011

The project research is directed at the development of a nonpoint source runoff model descriptive of watershed inputs from land areas receiving animal manures (rangeland production of animals and land application sites). Specific objectives are 1) detailed interpetative review of literature data for animal waste - land application research; 2) development of models describing the combined manure-soil processes between rainfall events and within rainfall-runoff events; and 3) conversion of models and data into algorithms for computer usage. Model development will follow and build upon existing hydrologic models and will coincide with other predictive developments of land use nonpoint sources for pesticides, fertilizers, forested, etc. Major complexities which differentiate the animal waste modeling are the presence of substantial organic matter, the manure effect on soil microbial cycles, presence of certain distinguishing species (fecal indicators and heavy metals), and the alterations of the soil structure and runoff potential. The major model user group will be 208 studies of watersheds in which significant rural land areas receive animal manures.

805011

Approximately 10 fresh water lakes in the vicinity of Richmond, Virginia, will be studied over a 3 year span in search of pathogenic free-living amebas. If pathogenic isolates are obtained, they will be studied by electronmicroscopy, immunologically, and for variance of pathogenicity.

805016

Fundamental adsorption and colloid stability theory, physico-chemical and mass transport concepts, and economic considerations will be employed to select optimum solids and conditions for an adsorption-denaturation virus removal process to be used in water treatment or wastewater treatment operations. Apparent free energies of adsorption of ^{3}H, ^{14}C labeled poliovirus type 1 will be measured by batch experiments on solid phases expected to have high total adsorption potentials. These values will be compared to those previously measured on low reactivity solids such as αSiO_2. Denaturation will be evaluated by looking at ratios of infectivity to count per minute in unadsorbed and desorbed virus preparations and by using rate zonal sedimentation analysis to check for viral degradation products.

A bench scale adsorption-filtration process will be designed to accommodate solid phases which appear to have the best overall applicability. This process will be tested with poliovirus type 1 using dechlorinated tap water and secondary effluent, under sterile and non-sterile conditions.

805 021

The proposed study will, using scientific sampling techniques, build a national data base of metered water consumption and other information suitable for the development of detailed, disaggregate demand models describing the various components of urban water use. The data will be obtained from the billing records of participating utilities and will be capable of periodic update in future years. The proposed work includes the preliminary analysis of this data, comparisons of results to past studies, and the calculations of price and income elasticities.

805022

This project will review and evaluate alternative modeling methodologies for economic, demographic, and land use impact projection. The objective is to select a set of sequential modeling methodologies which is most compatible with the information-projection-modeling requirements of EPA's ongoing water and air quality management programs. The project will also provide input to EPA's development of a Regional Residuals Environmental Management Handbook for state and areawide environmental quality management personnel.

A wide variety of allocation/projection models will be examined including: the Utah Process Economic and Demographic Impact Model (UPED), the Utah Process Land Use and Tax Base Impact Model (UPLAND), the Navajo Economic-Development Model (NED), Arizona Trade-off Models (ATOM), and the Economic and Demographic Projection Model (EDPM).

The output of the program will be a set of economic, demographic and land use projection models which can be made available for integration into the framework of EPA supported comprehensive environmental management planning programs. A software support package will be proposed to complement the model set and provide acceptability to a variety of existing planning computer systems.

805031

1. Objectives of this Project - Goal--to determine the impact caused by spillage of oil on June 23, 1976, in the St. Lawrence River in order to provide data necessary for the development of policies and/or procedures pertaining to matters dealing with the transport and/or spillage of hazardous materials in areas similar in characteristics to the St. Lawrence River system. Objectives--the specific objectives are: 1) to evaluate the adequacy of the clean-up of the June 23, 1976 oil spill on the St. Lawrence River; 2) to determine the effects of the spilled oil on small mammals, water fowl, aquatic and wetland resources; 3) to determine the levels of petroleum hydrocarbons within the affected ecosystems to determine the extent of contamination and bioaccumulation from this spill; 4) to determine the economic impact of the oil spill; 5) to synthesize the findings derived in meeting objectives 1-4 above into a form usable to achieve the stated goals of this research effort.

2. Approach - The approach to be taken to complete the work described is the application of acceptable methods and procedures as required to accomplish the specific elements. The synthesis of the findings of the specific elements into a form that is usable as a policy or decision-making tool will be accomplished through utilization of the professional knowledge of both the researchers involved in the work elements, plus others knowledgeable in specific disciplines related to the subject. The latter groups will be incorporated into the process through the interaction of a "steering committee." Membership on this committee will be from both Canadian and United States organizations and insitutions.

3. A detailed work plan has been developed and a coordination mechanism has been established in the form of an international steering committee. Preliminary contacts have been made to ensure data availability upon approval of the requested grant.

805032

(1) Prepare compendiums of marine water quality for Washington state using chemical composition and toxicity to bivalve mollusc larvae as parameters. Statistically analyze this data to determine which areas in the marine environment are toxic to bivalve larvae and the relationship between various chemical parameters and toxicity for one or more stations.
(2) The approach is to analyze the above water quality/toxicity data which has been collected by the Department of Fisheries for the past 15 years at more than 300 different locations, many of which were sampled at various depths. This approach will involve utilization of existing statistical programs and development of relatively unique ones to handle the complex statistical relationship between toxicant concentration and responses of bivalve larvae. Statistical tests will include versions of linear and multiple regression and factorial analysis of variance.
(3) Progress to date has been the partial development of the water quality compendium for the surface waters of Washington state.

805041

This proposal is to develop a continuing research program in pertinent bacteriological studies as a complementary effort of the University principal investigator and the on-going research needs of the E.P.A. Arctic Environmental Research Station. Two specific research studies are initially proposed: "Mutagenicity of Intermediate Compounds Formed in Microbial Petroleum Degredation" and "A Study of Obligate Psychrophiles and Environmental Pollutants".

In the first study, the mutagenic potential of petroleum components on environmental bacteria, especially in cold climate conditions, is to be investigated. Also, it is to be determined if microbial action on crude petroleum produces these mutagens which may have carcinogenic functions in the aquatic food chain.

The second study is to be a thorough investigation of obligate psychrophilic bacteria in the cold fresh water and soil environment. The role of oil spills on this population and the possible decontamination effects of the metabolic action of the organism are to be studied.

R 805059-01-0

METHODS DEVELOPMENT FOR ASSESSING TRADEOFFS IN ENVIRONMENTAL MANAGEMENT. To advance the state-of-the art in measuring, evaluating and weighing the tradeoffs inherent in environmental decision-making by (1) further developing the tools needed to measure and evaluate benefits, (2) advancing decision methods to be used in descriminating among alternatives, (3) defining the role for relevant cost and benefit information in decision-making and (4) determining the areas of environmental research which could most effectively contribute to improved decision methodology.

805065

The purpose of this project is to advance the state-of-the-art in benefit estimation for water pollution control experiments.

Much scholarly effort has been devoted to benefit-cost analysis during the last two decades. This work has resulted in important improvements in basic concepts and in defining the relationship between benefit-cost analysis and basic economic welfare theory. Estimating benefits of environmental improvements is intrinsically more difficult than estimating costs, and much work remains to be done.

Until the last ten or twenty years, interest in water projects focused on quantity improvements. Most benefits from such projects are relatively easy to define and estimate. In recent decades, interest has shifted to water quality improvements, whose benefits are elusive and difficult to measure. This project will survey the literature on water quality benefit estimation, undertake basic analytical improvements and do empirical studies to demonstrate the practicability of the techniques that are recommended.

Every step of benefit analysis will be studied: program goals must be translated into discharge abatement; abatement policies will be translated into improvements in ambient water quality; effects of water quality on health, property, water life and recreation will be studied; and benefits must be assigned dollar values.

SECTION III

CROSS-WALK FOR FY 1976 PROGRAM ELEMENTS

PROGRAM/SUB-PROGRAM AREAS	PROGRAM ELEMENT NUMBER		
HEALTH AND ECOLOGICAL EFFECTS			
HEALTH EFFECTS	1AA601 1FA628	1BA607 1HA630	1EA615 1LA629
ECOLOGICAL PROCESSES AND EFFECTS	1AA602	1BA608	1HA616
TRANSPORT AND FATE OF POLLUTANTS	1AA603	1BA609	
ENERGY			
EXTRACTION AND PROCESSING TECHNOLOGY	EHE623		
CONSERVATION, UTILIZATION AND TECHNOLOGY ASSESSMENTS	EHE624	EHE626	
HEALTH AND ECOLOGICAL EFFECTS	EHE625		
INDUSTRIAL PROCESSES			
MINERALS, PROCESSING AND MANUFACTURING	1AB604 1BD613	1BB610 1HD620	1BD612
RENEWABLE RESOURCES	1DC058	1HB617	
PUBLIC SECTOR ACTIVITIES			
WASTE MANAGEMENT	1BC611	1DC618	1BC362
WATER SUPPLY	1CC614		
ENVIRONMENTAL MANAGEMENT	1DC310	1HC619	
MONITORING AND TECHNICAL SUPPORT			
MEASUREMENT TECHNIQUES AND EQUIPMENT DEVELOPMENT	1AD605	1AD606	
QUALITY ASSURANCE	1HD621		
TECHNICAL SUPPORT	1HD622		

MAJOR DIVISION OF PROGRAM ELEMENT NUMBER

1A	Air	1B	Water	1C	Water Supply
1D	Solid Waste	1E	Pesticides	1F	Radiation
1H	Interdisciplinary	1L	Toxic Substances	EH	Energy Research and Development